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Published by the AMERICAN ELECTROPLATERS' SOCIETY

DECEMBER 1938 ∴ CHRISTMAS NUMBER

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A Society for the Advancement of the Science of Electroplating

DECEMBER 1938

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Electroplating Advancement in 20 Years

GEORGE B. HOGABOOM
Engineer, Hanson-Van Winkle-Munning Co.

The application of a metal to another metal or to a non-metallic surface by electrodeposition is almost a century old. It was due to a desire to silver plate metal that Faraday was induced to put his conception of producing electric current into concrete form. He designed a machine that not only made it possible to electroplate one metal upon another but that opened up a field that even today has undiscovered possibilities. The developments of other uses for electric current were so far reaching that electroplating became relatively a minor factor, still an important one; yet, even today many who are well informed in the realms of electricity know very little about electroplating.

It was not until about 1918 some attention was given to the need of a better understanding of the principles of the electrodeposition of metals. What had been done was just accepted yet the accomplishments were of great importance. Electrotyping which had been done with chemical batteries for a few years previous to the construction of the Woolwich electroplating machine rapidly developed into one of the most useful arts. It is due to electrotyping that books are universally available, without which progress in education in any of its vast and ever widening fields would have been greatly retarded.

Electrorefining of ores, which is electroplating on a large scale, has given industry pure metals at a price which has made it possible to achieve results that would have been almost impossible, e.g. the economical production of pure copper—the essential metal for generation and conductance of electric current. It also made the recovery of precious metals that were bound up

with other metals possible without the necessity of long expensive separation by smelting. Silver and gold are electrolytically recovered from copper ores; and, since 1918, platinum, palladium and rhodium from nickel ores.

The electroplating of metals for protection against corrosion, for ornamental and for useful purposes was given slight attention, yet it is useful to every one from his birth to his grave. The instruments used at birth were nickel plated; the trimmings of the casket, his last home, were made attractive by electroplating; in fact, the coffin may have been made by the electrodeposition of copper. During life the knives, forks, spoons used were no doubt electroplated with silver. The ornaments of the household, the electric appliances and the metals used for personal adornment the electroplater made more durable and beautiful. The paper currency used for obtaining these necessities or the enjoyments of life is printed from plates made by electrodeposition of iron. Our metal coins are embossed in dies that have been chromium plated—by methods developed long after 1918.

Electroplating processes were just allowed to grow. The development was left in the hands of men who were taught by word of mouth and by precept and who guarded their knowledge. The value of making a base metal appear like a noble metal, and thereby increasing its appealing attractiveness; or, the electroplating of a steel knife to make it more serviceable; or, the increasing of the useful life of steel hardware by electroplating with zinc was acknowledged and accepted as a necessity. The actual practice of electroplating was little understood by the manufacturer and still less by the consumer. It was often referred to as a "necessary evil" which was mainly due to the lack of understanding the possibilities of what could be accomplished.

That this lack of even a general comprehension of the industry existed was proved in 1918 when a large number of those who accepted contracts for the production of materials and equipment to be used in war could not understand and apply the specifications that had been issued for electroplating. The fault was not entirely that of the industry as many of the specifications were drawn by those who were equally unacquainted with the

manner by which the desired results were to be attained. Since that time much has been accomplished both in the methods that are used and in the quality of the electroplated product. There is today an understanding of what is an electroplated article and what should be expected. The general public has become within the past 10 years "electroplating conscious" and readily assert their opinion of electroplated articles—especially those on their automobiles.

In 1909 the American Electroplaters' Society was organized. The membership consisted of men who were production foremen in electroplating departments. The sole object of the organization was the education of its members through exchange of knowledge and research. When a conference was called in 1918 at the Bureau of Standards in Washington with army and navy representatives to discuss electroplating specifications and methods for production, the members of that society readily responded and gave valuable assistance. It was decided at that conference to establish a section of the chemistry division at the Bureau to which all electroplating and finishing of metal problems could be referred. A member of the Electroplaters' Society was appointed travelling adviser—the liaison man between contractors and the different divisions of the army and navy departments. That was the beginning of the investigation of electroplating problems at the Bureau of Standards. Since that time much progress has been made. During the 20 years that have passed a large number of investigations have been made and several instructive reports issued. The American Electroplaters' Society a few years after the work started, established at the Bureau a Research Fellowship. The first research was upon a problem that had long been an expensive annoyance to many manufacturers especially those making builders hardware. During the humid weather, in the summer and fall months, destructive spots developed upon electroplated articles that were finished and even ready for shipment. This investigation was supported by many manufacturers especially those members of the American Hardware Association. This was followed by the study of other problems, including the deposition of chromium, and also the manufacture by electrodeposition of printing plates for the Bureau of Engraving and Printing. The transfer method was a slow and expensive one

and it was not possible to keep up with the demand for printing plates. The first electrolytic method installed was a composite electrotyping process. It was found that an all copper electrotype would not withstand the wear given the plates on the printing press. A nickel electrotype gave better service. It was not possible, at that time, to build up an electrodeposit of nickel of sufficient thickness but it was found that a satisfactory plate could be had by making an electrotype of alternate nickel and copper deposits. Plates that finished at 3/8″ were successfully produced. Further investigation led to the adoption of making the electrotypes with iron and facing them with a coating of chromium. This process has proved so successful that practically all plates used for printing paper currency at the Bureau of Engraving and Printing are iron electrotypes. The destruction of a worn plate is now a simple matter—it is thrown, under strict Congressional supervision, into the cupola of the iron furnace at the Washington Navy Yard.

The American Electroplaters' Society decided about 10 years ago that one of the most important problems was the protective value given iron or steel by electroplated coatings. This research was supported by many individuals and manufacturers. The Bureau of Standards provided space and supervision and much assistance. A large number of panels made of cold rolled steel were plated with copper and nickel, zinc, cadmium and chromium. The copper and nickel deposits were made in various alternations and thicknesses. The final coating was nickel upon which was deposited a coating of chromium. Different thickness of zinc and of cadmium were plated under several conditions on steel panels. Several specimens of hot dip galvanizing were also used.

Through the co-operation of the American Society for Testing Materials these panels were placed on suitable racks at several locations; for coastal cities—Key West and Sandy Hook; the industrial centers, Pittsburgh and New York City were selected and for suburban tests, Washington, D. C., and State College, Pa. The result of this research has been the drawing up of specifications for electrodeposits of copper, nickel, chromium, cadmium and zinc on steel by a joint committee of the Bureau of Standards, American Electroplaters' Society and the American

Society for Testing Materials. The latter society has adopted the specifications as tentative and in another year they will become standard.

The same scope of research is now in progress for electroplated coatings on non-ferrous metals. The panels are being plated at the Bureau of Standards. Many duplicate panels were processed at manufacturing plants under the supervision of the A.E.S. Research Fellowship so as to obtain panels plated under actual commercial conditions. These panels have been recently placed on the A.S.T.M. exposure racks. The results of this comprehensive research will be of inestimable value to the manufacture of electroplated metal parts. The continued support of this work is essential for its completion. One has but to observe the quality of the electroplating on the automobiles made since the research on electroplated steel has been completed to see the value of such researches. The cost is startingly nominal. If a tax of one cent was placed on each automobile manufactured since this research has started all expenditures would have been covered. Yet, it must be recognized that the same value is available to a large number of other industries.

A brief resumé of what has been accomplished in the past 20 years with each of the metals commonly used in electroplating will illustrate the progress that has been made.

The electrolytic refining of copper was well developed and electrolytic copper had a place on an even basis with "Lake" copper. Recently the quality of electrolytic copper has been improved by removing oxygen and its compounds before casting into wire bars or plates. A process has been perfected for the production on a commercial scale of thin copper sheets. This is done at the refinery where the same electrolyte as used in the tank house is directed through a special unit which consists of a large rotating drum upon which the copper is deposited and from which it is continuously stripped as sheet copper. A most interesting development of process in which a similar unit is employed is the manufacture by electrodeposition of copper screen cloth. Screen of finer mesh than can be made with woven wire is commercially produced. The future application of the products of this process seems to be unlimited in its special field.

Sound movies required that phonograph records be made more rapidly than what had been done only a few years ago. It required from 12 to 24 hours to deposit copper sufficiently heavy enough to make a "stamper" for the production of records. The rate of the deposition of metals depends upon what is known as the current density per sq. ft. i.e., the number of amperes used. Twenty amperes per sq. ft. was considered good but when 40 to 60 amperes were advocated, it was thought a great stride had been made. Today, copper is deposited in the making of stampers at 500 amperes per sq. ft. and 1,000 amperes will soon be used. This means a decreasing of the time of plating from 24 hours to approximately one half hour. The speeches made at any important event, the story of a football game is told to a newsreel audience within three and one-half hours.

Electroforming, the making of an article by electroplating copper on a removable core is being rapidly developed. Elbows, tees, etc. for plumbing goods, manifolds for engines and numerous other appliances are being economically produced. If your dentist in taking an impression for new teeth uses a holder for the plastic which is water cooled he is using a device that can be made only by electroplating.

The electrolytic refining of zinc received its greatest impetus about 20 years ago when there was demand for it as a war material. It was not, however, until a few years ago that a process was developed to electroplate steel wire in the same electrolyte as used in refining. In one plant 80,000 lbs. of steel wire is electroplated each day with zinc at the rate of 1,000 amperes per sq. ft. The solution used is made from the zinc concentrates from the mines. The wire travels through the solution at the rate of 100 ft. per minute and receives a coating of pure zinc one thousandth of an inch or more thick. The electrogalvanized wire has properties that cannot be had by the "hot dip" galvanizing process. It is not now possible to hot galvanize strip steel stock, but there is in development methods to electro zinc plate strip steel. It will be only a short time when electro zinc plated steel sheets will be offered in competition with the hot galvanized sheets.

With the development of continuous rolling of steel strip stock the demand came for tinning the strip steel for the canning industry. Through an electroplating process this has been

accomplished. In a steel mill today a production is being had of from 30,000 to 50,000 lbs. of strip steel that has been successfully electro tin plated. New units of a unique design that will electroplate strip steel with tin are in the process of construction. The strip steel will travel at the rate of not less than 200 ft. per minute and will have the same weight of tin deposited as is now on sheet stock tinned by the hot dip process.

Strip steel is plated in acid tin solutions which are of recent development. New alkaline tin plating solutions had been developed to meet the need of the electro tin plating parts of refrigeration units that could not be hot tin dipped. Tin plating is extensively used on automobile cylinders.

It was thought when chromium plating was first done on a commercial scale that it would replace nickel as an ornamental electroplate. Instead of displacing nickel it created a demand for better nickel plating. The electro nickel coating had to be bonded thoroughly to the basis metal, be more continuous and have less porosity and be free of any surface defects. The increased use of nickel as an undercoat for chromium deposits brought about the necessity of more rapid plating and the development of new solutions. That, in turn, required better and higher quality nickel anodes. The Adams solution made with nickel ammonium sulphate, (double nickel salts,) was displaced by solutions of higher metal content made with nickel sulphate, (single nickel salts,) about 20 years ago. A warm nickel solution—the Watt solution—had been recommended but it was not until about 1918 that it came into general use. Modifications of the Watt solution are now being used at current densities more than ten times that permissible in the Adams solution and there is no doubt but greater improvements will be made. The advent of chromium plating can also be credited with the development of the Bright Nickel solutions which are in commercial production. The nickel-cobalt bright deposits are not only more attractive than those of nickel, but due to the increased protective properties, form a most excellent undercoat for chromium deposits. A nickel solution has recently been developed to nickel plate stainless steel.

Heavy nickel plating is rapidly increasing. The advantages of nickel in industries where equipment is required to withstand

chemical corrosion has enabled the solving of many problems. Nickel is also being used to build up worn or undersized parts of equipment or machinery. The term "electrolytic" casting can be aptly applied to electroplating heavy nickel and other metal coatings.

The electrodeposition of iron has been referred to in the making of the printing plates for paper currency. Iron can be used to build up worn and undersized parts of machinery. It has the advantages that it can be easily machined, drilled, threaded and hardened by carbonization. Deposits up to one-half inch have been made which have been heat treated so as to obtain a surface hardness equal to that of carbon tool steel. The electroplating of iron has not received the attention it merits. There are numerous applications that have proved successful and of economical value.

Permalloy can be made by electrodepositing the alloy of nickel and iron in the required percentage..

Chromium as an ornamental electroplated coating is so universally known and accepted that it is difficult to realize that the commercial application of chromium plating is slightly more than 10 years old. No other electroplated metal has attracted so much attention. Its non-tarnishing properties added greatly to the beauty and usefulness of countless numbers of articles—we see it everywhere. In the industry the electroplating of chromium on gages, dies, rolls and parts of machinery that could not be heat treated to produce hardness is common practice. The value of electroplated chromium in increasing the service life of numberless parts can never be estimated.

Cadmium is another metal the electroplating of which developed rapidly. Today it has an important place as an ornamental and protective coating. Just previous to 1920 a process was offered the metal trade for giving ferrous metals a protective coating that equalled that of electro zinc yet that had a more attractive appearance. Its adoption was very slow and it took several years before its real value was recognized. It has become so firmly established that when in recent years there was a shortage of cadmium available for electroplating that many of those who were a few years ago hesitant to adopt it actually clamored

for what could be had and willingly paid any price that was asked. The history of the electrodeposition of cadmium is unique and would make a most interesting metal story.

While much has been written about the electrodeposition of tungsten it is most always deposited as an alloy with some other metal. It is doubtful if pure tungsten has been electroplated. The alloy deposits have been found adaptable in several fields, especially in the electric industry as a coating for contact parts.

Of the rare metals rhodium is the one that has been successfully electroplated and commercially adapted. Several hundred installations have been made where it is used as a final coating on silverware, jewelry, etc., either as a finish or as a protective coating against tarnishing.

This progress can be no better illustrated than to note the increased use of nickel for plating in the past 20 years. Previous to 1920 about 500,000 lbs. of nickel were consumed as salts and anodes. A tank holding 1,500 gallons of nickel solution was then considered a very large installation; today in one automobile plant there is a plating tank that contains 25,000 gallons of nickel solution and requires 90,000 lbs. of nickel anodes. In 1937, 11,500,000 lbs. of nickel were used in electroplating.

Electroplating equipment has kept step with the development of new solutions and new processes. Semi and full automatic plating equipment has been constructed to meet almost every need in mass production.

About 1920 an electroplating engineer was asked to survey the industry and give an estimate of the probable number of places where a full automatic plating machine could be used. His estimate was less than 30; yet, today there are more than that number in one automobile plant. The range of articles that can be electroplated on a full automatic plating machine is very wide—from a definite weight of gold on a safety razor to the nickel plating of bumper bars with a composite copper-nickel deposit of .001″ or more.

The development of the source of current for electroplating is a story in itself. The modern interpole motor generator set—homopolar low voltage generator—the plate type copper oxide rectifier is a long distance from what was available twenty

years ago. With these have come efficient rheostats that have a definite voltage drop to replace those cumbersome devices in which it often appeared as if more current was used to heat the resistance coils than was used in depositing metal.

The field of electroplating is continuously broadening. It is at present the subject of a large number of researches both here and abroad. The discussion of electroplating often has an important place in the meetings of many technical societies, especially those interested in metals. In March, 1937, an international conference on electroplating was held in London, England, under the sponsorship of the Electrodepositors' Technical Society of England. In June, 1939, the second international conference will be opened at Asbury Park. N. J. At this conference there will be an exhibition of electroplated work and electroplating equipment. The Newark Branch of the American Electroplaters' Society will endeavor to demonstrate the progress electroplating has made since its commercial inception in England in 1839.

BERNARD C. CASE

has joined the staff of the Hanson-Van Winkle-Munning Company, manufacturers of electroplating equipment and supplies, Matawan, New Jersey. Mr. Case, who will devote himself to special sales work for the company, graduated from the University of Michigan in 1928. He has been engaged in chemical work, first for the Eaton Manufacturing Company, Cleveland, Ohio and later for the Bridgeport Brass Company, Bridgeport, Conn., where he was in charge of plating. Mr. Case has done original research in electroplating and has taken out a patent (assigned to the Eaton Manufacturing Company) on an anode for the control of pitting in nickel solutions.

Anodic Behaviour in *Alkaline* Plating Solutions

By A. K. GRAHAM

Presented before the Detroit Branch of The American Electroplaters' Society Friday Evening, Nov. 4, 1938

ABSTRACT

ANODIC behaviour in alkaline plating solutions with particular reference to the Rochelle salt copper plating bath with the advent of high speed plating processes, and the demand for more intimate knowledge regarding the effect of variables in these processes has been emphasized. Today nickel, copper, brass, bronze, zinc, tin and silver are or can be successively deposited at current densities, which but a few years ago would have been regarded as excessive.

As one attempts to raise current densities in a given plating process a value is ultimately reached at which the anode ceases to function satisfactorily. It has been shown in recent articles on the Rochelle salt copper plating bath that at the limiting anode current densities the copper anode will become heavily coated with an insoluble film and that the voltage will rise abruptly to a prohibitively high value. A similar phenomenon may be observed with a copper anode in an acid copper plating bath. Ordinarily the permissible anode current density in an acid plating bath is higher than in an alkaline plating bath for the same metal. This difference arises as a result of the greater complexity of the anodic process, in an alkaline bath.

To illustrate the above point we might represent the anodic reactions in both acid and alkaline copper baths as follows.

Acid
(1) $Cu + So_4^{=} \longrightarrow CuSO_4$
(2) $H_2O + SO_4^{=} \longrightarrow H_2SO_4 + O$

Alkaline
(3) $Cu + CN^{-} \longrightarrow CuCN$
(4) $CuCN + NaCN \longrightarrow NaCu(CN)_2$
(5) $CuCN + 2NaCN \longrightarrow Na_2Cu(CN)_3$
(6) $H_2O + 2CN^{-} \longrightarrow 2HCN + O$

Referring to the acid copper bath it may be seen that the copper is attacked directly by the sulphate ion to form copper

sulphate which is soluble in water in accordance with equation one. If the current density at the copper anode is too high in this bath the efficiency will be under 100% and the sulphate ion will decompose water at the anode forming sulphuric acid and liberating oxygen as shown by equation No. 2. When this occurs further reactions result in the formation of films which lead to the excessive polarization and a loss in efficiency as the anode current density is raised to higher values.

In the alkaline solution the primary reaction illustrated by equation No. 3 is for the cyanide ion to combine with copper to form copper cyanide which is insoluble in water. Free sodium cyanide must be available to dissolve the copper cyanide in accordance with equation No. 4 or No. 5, which illustrates two of the possible soluble complex copper cyanide compounds which are undoubtedly present in copper baths. Ordinarily the efficiency in the alkaline copper bath is always less than 100%. This means that the cyanide ion will react with water at the anode to form hydrocyanic acid and liberate oxygen in accordance with equation No. 6. The oxygen so generated is capable of further reactions which undoubtedly lead to the formation of insoluble film on the anode which ultimately results in secondary reactions of an undesired nature. Furthermore, as the current density at the anode is increased the rate at which copper cyanide is formed also increases and it is possible that its rate of formation will exceed the rate at which free sodium cyanide becomes available in order to form the soluble complex copper cyanides mentioned in equation No. 4 and No. 5. This results in a further decrease in anode efficiency and an increase in oxygen liberation, ultimately leading to films which cause excessive polarization at the anode.

Where rochelle-salt is present in the bath a further reaction with copper to form a complex compound is also possible.

It is apparent from the above comparison that the anodic reactions in the alkaline bath are much more complicated than in the acid bath. It is not surprising, therefore, that the conditions for satisfactory operation at the anode in an alkaline bath are more limited than in the acid bath, in fact, rapid processes of

deposition appear to be limited more by the anodic behavior than any other single factor.

The question now arises as to what can be done to improve the anodic picture. It is suggested that in answering this question in any alkaline plating bath that attention be focused upon the variables that are ordinarily involved. To illustrate this point I shall outline below the variables which are ordinarily involved in the rochelle salt copper plating bath which have a bearing upon the performance of the anode.

No. 1—THE ANODE CURRENT DENSITY

This is ordinarily decreased by increasing the anode area available in the tank. It is not uncommon to have the area of the anode one to three times the area of the cathode in order to accomplish this result.

No. 2—THE EFFECT OF TEMPERATURE

An increase in temperature may result in—

a—Increase in solubility of the products formed at the anode.

b—A decrease in the effect of oxygen, associated with the ability of an increase in temperature to decrease the oxygen polarization.

c—The effect of free cyanide. It has been shown by Wagner and Beckwith and others that as the temperature of a cyanide copper bath is increased the complex copper cyanide undoubtedly changes from that shown in equation No. 4 to that shown in equation No. 5. The extent to which this equilibrium shift from one complex compound to another might occur determines the extent to which extra sodium cyanide is made available in the bath.

d—If the temperature is increased too far unfavorable reactions occur such as the decomposition of free sodium cyanide. Furthermore, temperature greatly influences the character of the deposit and this fact may limit the extent to which temperature may be varied in an effort to improve the anode situation.

No. 3—THE EFFECT OF SOLVENT CHEMICAL

In the rochelle salt copper bath one may regard the free sodium cyanide as a solvent chemical. Rochelle salt may also function as a solvent chemical. If the free sodium cyanide is increased it will tend to dissolve the insoluble copper cyanide more readily and thus tend to improve the anode performance. One is seriously limited, however, in considering an increase in free cyanide because of the reduction in cathode efficiency and increases decomposition of cyanide in the bath which results.

No. 4—THE EFFECT OF pH

It has been shown that if the pH of the rochelle salt copper bath is increased to above 13.0 that the anode efficiency is reduced to a prohibitively low value. On the other hand a pH of about 12 to 12.8 will allow a result in a reasonably high anode efficiency.

No. 5—THE EFFECT OF IMPURITIES

Wagner and Beckwith have shown that iron in excess of 7.5 gms/L results in a loss in anode efficiency. In general any impurities which might so effect the anode performance should be recognized as being detrimental and should, therefore, be controlled.

No. 6—THE EFFECT OF CARBONATE

In a recent publication by Read and the speaker it has been shown that a high carbonate content in a rochelle-salt copper bath will permit the use of exceedingly high current densities at the anode but that this is only accomplished by virtue of the fact that the copper is behaving as an insoluble anode and that the efficiency is almost zero. One would conclude that it is very important to control the carbonate content because of its effect upon the anode performance.

No. 7—THE EFFECT OF INSOLUBLE ANODES

In the same article mentioned above it has been shown that an insoluble iron anode in conjunction with soluble copper anodes will prevent the formation of insoluble films upon the copper anode in a rochelle salt copper bath. This in turn prevents the excessive polarization of the copper anode. The area of the

insoluble anode required for this purpose does not have to be great and the amount of the insoluble anode area can be varied in order to control the amount of copper which is dissolved at the anode so that the metal content of the solution may be kept reasonably constant.

No. 8—THE EFFECT OF AGITATION

Agitation if intelligently used causes a rapid replacement of the electrolyte in the film adjacent to the anode surface. By so doing the conditions in the film of electrolyte more nearly approximate the conditions in the main body of the electrolyte. As a result the permissible anode current density is usually increased and the tendency to polarize and to form insoluble films is usually decreased.

The above variables have long been recognized in electroplating. Where high speed plating processes are being considered many of the above variables will be found to exert profound effects and where the anode performance is usually the limiting factor, the intelligent use of the above variables will frequently result in a marked improvement in anode performance.

FURTHER NOTES ON NICKEL ANODE CORROSION

By W. L. Pinner and L. C. Borchert

The following constitutes additional information in connection with the paper presented at the Milwaukee Convention entitled, "The Importance of Correct Anode Corrosion in the Electrodeposition of Nickel".

Data were presented in this paper involving the behaviour of high purity, cast carbon nickel anodes. More particularly, the amount of loose nickel particles produced on corrosion of such anodes in a low pH Watts bath was discussed. Definite quantitative measurements of the percentage of loose particles found in normal anodes, and the authors' opinion of the maximum allowable amounts were given. It was stated that if the amount of loose particles exceeded 0.04% of the amount of anode used, that rough plate would be likely to result.

Following the presentation of the paper, Mr. T. F. Slattery of the U. S. Bureau of Standards inquired if any information was available on the behavior of such anodes in a Watts bath oper-

ated at an elevated pH, for example, pH 5.4. This information was not available at the time but has subsequently been obtained and the results of this added investigation have been sufficiently interesting to justify their publication, thus adding to the information already published in the original paper.

For the purpose, four cast carbon anodes were taken, corroded first in a Watts bath at a pH of 2.0, and the amount of loose particles liberated was determined. The anodes were then corroded in a Watts bath, identical in every respect to the one previously used with the single exception that the pH was raised from 2.0 to 5.4. A second determination of loose particles was made. The corrosion tests and the measurements of loose particles were carried out as described in the paper. The following are the results of these tests:

Anode No.	*% Loose Nickel at low pH*	*% Loose Nickel at high pH*
1	0.00475	0.1307
2	0.00428	0.0558
3	0.00167	0.0578
4	0.00257	0.0925

It will be noted, from the above, that the loose nickel particles produced at high pH increased at least eleven times that from the same anode at low pH. In the case of anode No. 4, the amount of loose particles produced at high pH is thirty-seven times that produced at low pH. All anodes, at low pH, came well within the desired limits as to percent of loose nickel allowed whereas all anodes are decidedly outside the acceptable range at high pH.

The anodes possessed a smooth, shiny appearance after corrosion at a pH of 2.0, but became very rough and dull in appearance after corrosion at pH. 5.4.

These results were of sufficient interest that contact was made with the manufacturers of the particular anodes involved. The anode makers stated that they were fully cognizant of this action and had not recommended the particular anodes involved for use in a high pH Watts bath.

This additional information is another justification of the authors' repeated statement that, "the plater is well advised who consults carefully with the anode maker before putting just any nickel anode into any plating bath".

Why Bright Nickel?

By JOHN ACHESON

Presented at Toronto Branch Meeting October 24, 1938

MY thought originally had been to talk about the present methods of electroplating as compared with those of times gone by, but upon reflection I realized that in order to do justice—even in a sketchy way—to a subject obviously so broad, would entail going into the entire history of plating from its inception, and trace its development from the beginning or early days to the present, in order to properly present a correct comparative picture of the old methods and accomplishments as compared with those of to-day.

It should be obvious to all of us that a paper presented along the lines indicated would of necessity have to be of considerable length, and even then would probably fail in covering in detail many of the most important developments necessary to clearly picture modern methods as compared with those of the past.

I am one who believes in the policy of dealing with one thing at a time, on the grounds that by so doing there is less chance of creating confusion of thought—the result being that after we have thoroughly discussed our one subject and arrived at our conclusions, we can then pass on to another.

Thus having established my grounds—at least to my own satisfaction—by not attempting to cover the field as broadly as would be indicated by the title of the subject as announced in the "monthly notice" of this meeting, it is my intention at this time to deal with a subject that at the present is the source of the greatest interest to the plating industry—namely:

BRIGHT NICKEL PLATING

Practical nickel plating, as most of us know, dates its birth from the invention of Dr. Adams. His nickel solution was composed of Sulphate of Nickel and Sulphate of Ammonia—otherwise known as the Double Nickel Salt Bath. This particular bath has a metal content of about 1.75 ozs. of nickel per gallon; was always operated at room temperature, the permissible current density generally being three to five amperes per square foot.

It was not unusual with this solution to plate iron or steel as much as two and one-half hours, in order to obtain an appreciable thickness of plate. The thickness was generally estimated by the appearance of the article and how it stood up under the buff—for the reason that an ammeter was almost unknown as a plating adjunct in the early days.

The next marked development in the field of Nickel Plating was the introduction of what is known as the *Watt* solution. This particular solution was first produced by Dr. Oliver P. Watt, of the University of Wisconsin, and consists basically of Nickel Sulphate, Nickel Chloride and Boric Acid, having a metal content of approximately 7 ounces of nickel per gallon. With this particular solution, operated hot instead of at room temperature, and because of its higher metal content, we can obtain a plate thickness equal to that obtained from the Double Salt Solution in from one-fifth to one-tenth the time.

Along about the time of Dr. Watt's production of the Single Salt Bath, came the demand of the Automotive Industry for considerable plating of parts for decorative purposes. Most of the parts at this time were made of stamped steel, and while the finished job at first was a joy to behold, a few months, and even a few weeks of exposure to the elements, usually resulted in rusty parts. This condition was due very largely to the fact that at first there were no specifications covering plate thickness, porosity of plate, etc.

The remedy was obvious. The Automotive Industry adopted standards of plate thickness which experience and research had determined as sufficient to prevent steel parts from rusting within a reasonable length of time. The standards, generally speaking, called for a minimum finished thickness of .001″ of plate on the significant surface. In order to obtain this finished thickness, it would be necessary to plate on an extra 10 to 25% of nickel, to allow for the metal cut off by the buffer. The trouble seemed to be, however, that it didn't occur to anyone to tell the buffer about these specifications, and as a result he went about the business of buffing in his characteristic manner, by putting his weight against the wheel. The result was that instead of the 10 to 25% nickel removal figured on, frequently the amount cut away would be 90%, particularly at hole edges and on projecting

parts. The result was a rusty job. Therefore, while marked advances had been made in production of good nickel plate, the desired standard of perfection up to this point had not as yet been attained.

The next or latest step in the field of nickel plating is what is known as "Bright Nickel".

To many nickel platers, the plating of bright nickel is not new. Many have for years used brighteners in their plating barrels, and in some instances in still tanks, in order to obtain a plate of such brightness that subsequent buffing would not be necessary. Many of us are familiar with the fact that at least one well-known supply house has had a bright nickel solution on the market, and in more or less general use for more than twenty years. However, these particular forms of bright nickel had their limitations, in that it was not possible to plate to a thickness of more than .0001" to .0002"; otherwise, peeling or cracking would take place.

It was not, however, until 1932 that any real success was attained along the lines of producing a bright nickel plate with all the desired characteristics, complete and perfect brightness, and minimum porosity. At this time, a patent was issued to one Schloetter by the United States Patent Office, under date of November 10th, 1932, covering a bright nickel plating solution capable of producing a plate presumably having all or most of the above features. Since that date, patents have been issued to some four or five other concerns or individuals, covering a wide variety of bright nickel solutions.

Basically, all these various solutions are made up according to the well-known Dr. Watt's formula, with one exception—that being a solution containing approximately 20% cobalt. The materials used in these standard solutions for the purpose of producing bright plates of desired quality cover quite a large range in varying combinations, and are said to include such chemicals as—

Sodium Formate
Formaldehyde
Gum-Tragacanth
Tellurium Salts
Nickel-bengal-disulphonate
Nickel-naphthalene-trisulphonate

The anodes used in bright nickel baths are usually of the cast variety, in a purity of 99% plus, with a small amount of carbon added. One exception is that of the Nickel-Cobalt solution, in which case the anodes are approximately 80% nickel and 20% cobalt.

It should be scarcely necessary to observe that in order to produce the perfect result from a bath of this kind, solution and all other plating conditions should be kept to fairly close standards. Solutions should be made up of chemicals of high standard commercial quality. Baths require frequent analysis in order to maintain correct balance, and are usually heated to a temperature of 130-150 degrees Fahr.

The anodes are usually bagged, in order to prevent loose particles of nickel floating over and settling on the work, causing roughness.

Frequent or continuous filtration is necessary in order that absolute solution cleanliness may be maintained.

Vigorous agitation in one form or another is necessary, such as propellor, air or cathode rod movement.

As these solutions may be operated at current densities as high as 60 A.S.F., the reason for heat and agitation is obvious.

With all the various conditions as enumerated in balance and functioning properly, it is quite possible and practicable to turn out a product of absolute brightness, of any desired commercial thickness, as ductile and free of pores as that obtained from any other type of nickel plating solution.

Now we go back to the automobile maker and his buffer. You will recall that the buffer had never heard of plate thickness specifications, and so had been the source of a lot of automobile makers' headaches, and in addition, hadn't they been piling on an extra 10-25 lbs. of nickel per hundred in their efforts to beat the buffer.

Then along came Bright Nickel to solve all the plating troubles by eliminating that pesky buffer. They would just hang the parts in the tank, plate to the required thickness, and no more; take the parts out, and Presto!—there you are—perfectly bright and no buffiing required—ready to go into the chrome and thence on the car.

An ideal set-up you will say. It would be if it worked out that way, but it doesn't in every instance. To be perfectly frank about the matter, we have to admit that under standardized production methods as practised in most plants to-day, it would be impracticable to pass the vast assortment of parts through a bright nickel bath and at the same time maintain control of the various solution factors with the current adjustment necessary in order to obtain the 100% perfect job. The general use as established in most plants to-day is to accept the job as it comes from the tank, and then pass it through a colour-buffing operation. It may be found that from fifty to ninety percent of the parts require nothing more than the removal of water stains. The balance may be cloudy or off-colour, and may be brought back to the desired brightness with a very light buffing, in which practically no nickel is removed from the parts.

In my humble opinion, bright nickel is an accomplished fact, and is here to stay. Just to what extent it may find application in the nickel plating field generally, I am not prepared to predict at the present time. I do feel, however, that as time goes on, Plating Research Engineers will continue to develop and improve the process until finally we may have at our disposal the ideal Bright Nickel Plating Solution.

NOTICE

Owing to the amount of material received this month for publication there are several abstracts, Branch news and other items that we are forced to omit from this issue. These will appear in the January REVIEW.

Obituary

Mr. Warren Guy, for ten years supervisor of polishing and plating at Trico Products, Inc., Buffalo, died November 20. Mr. Guy was one of the most active members of Buffalo Branch, A.E.S., and one of its charter members.

Burial was at Binghamton, N. Y.

We extend our sincerest sympathy to the members of his family in their sorrow.

Business and Social News

BRANCH NEWS

Educational Activities

AMERICAN ELECTROPLATERS' SOCIETY

WATERBURY BRANCH

Minutes of meeting held Friday, Nov. 11th, 1938. Dr. C. B. F. Young of Columbia University spoke on "The Mechanism of Cobalt Nickel Plating". As he said in the introduction of his talk, he was not talking on Cobalt Nickel Plating, per se, but on the effect of various factors in the composition of baths.

The work described was chiefly of a theoretical nature, that is, work as done in a laboratory, but was presented in such a manner that it was easy for a practical man to understand and also of considerable use to a practical man to understand the effect of the variables on the composition of the alloy deposited. He showed the effects of agitation, temperature and current density on the composition of both cadmium zinc and nickel cobalt plating. He also showed the effects of very small additions of organic materials to the bath in changing the character of the plate and the composition of the plate. From this he gave the origin of the cathode and anode film theory which he put forth in reporting the results of his investigations. He showed how this theory could answer a good many of the problems which come up in plating and is probably the best theory which we have today for describing the mechanism of plating.

Mr. Young answered questions for approximately three-quarters of an hour after the meeting and it was voted that the speaker was an unusually good one.

Mr. Theodore H. Webersinn was elected a member of the Waterbury Branch at the meeting.

It was announced that at the December meeting Mr. F. F. Oplinger of E. I. Dupont Company will talk on "Bright Copper Plating".

E. T. CANDEE, *Sec.*

HARTFORD BRANCH

The Hartford Branch of the A.E.S. held its regular monthly meeting on Monday evening, Nov. 21, 1938, at the State Trade School in Hartford, Conn.

The meeting was called to order at 8:15 p.m. with Past Pres. Jas. Beloin in the chair.

Minutes of the previous meeting were read and accepted. All communications were read and placed on file. One bill for our second quarter P. C. tax voted paid.

One applicant, Mr. Frank J. Ciaramella, was elected to Active Membership, and one application for Associate Membership, from Mr. Merrill S. Hobart of East Hartford, was received and acted upon.

One member was reinstated, and granted a transfer to the Springfield Branch. The member was Mr. C. M. Hastie of Springfield, Mass.

The question of "Short Researches" was discussed to some length, and the secretary was instructed to secure more information in regards to the same.

Supreme Secretary, Mr. W. J. R. Kennedy was on a Branch visit, and gave a "pep talk" on "Increasing the Branch Membership".

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Mr. A. N. Austin was speaker for the evening, and gave a very interesting talk on the subject of "Buffing Compounds". His talk was accompanied by various samples of the different materials that are used in the manufacture of buffing compounds. In conclusion he was given a rising vote of thanks.

The meeting was adjourned at 10:30 p.m.

V. E. GRANT, *Sec.*

BOSTON BRANCH

Boston Branch met Thursday the 1st at the Bradford Hotel, Boston, with Pres. Delorme in the chair.

Minutes of the previous meeting read and approved.

Communications read: one from the Plated-Ware Exhibit Committee for an exhibit for the coming convention. Mr. Mintie will have one made up and it will be on display at Asbury Park, the other one from George Hogaboom in regards to the branch members doing some research work at their individual plants. Some of the members will try and do some of this research work and make a report on it in the near future.

Three members were elected to membership as follows: Benedict W. Bertini, 50 Hillcrest Ave., Lexington, Mass., associate; Louis V. Gagon, 259 Heath Street, Roxbury, Mass., associate; and Rudolph G. Loeser, 8 Brazil Street, Melrose, Mass., associate.

The chairman of the entertainment committee, Bill Treadwell, reports that arrangements are being made to hold the annual banquet on Saturday, March 4, 1939, at the Bradford Hotel, Boston, Mass., at 2 p.m., with an Educational Session, entertainment for the ladies in the afternoon, and banquet and floor show and dancing in the evening. Tickets will be $2.50 each. He asks every member to pledge himself as to how many tickets he will be able to take care of, so that he will have some idea on how to go ahead with his plans. He looks for co-operation from all the members to make this the best banquet yet. The Committee are Chairman William C. Treadwell, Allyn D. Chabot, Charles O. Hardy, Edward C. DeLorme, Harry J. Lack, Arthur W. Collins, Thomas F. Barron, Arthur J. Mintie, and Andrew W. Garrett.

Pledges from the members present were for fifty tickets so let the committee know how many you want.

Our librarian Arthur Mintie gave one of his talks that the members always like to hear about, "Barrel Burnishing and Barrel Plating". He went back to forty years ago when they had no barrels and the work was plated in baskets and right on up to the present day. He explained how he gets the best results in burnishing barrels and also the plating of these parts in the different plating solutions.

It was a very fine talk and he was given a vote of thanks for his interesting talk.

The meeting adjourned at 10:30 p.m.

A. W. GARRETT, *Sec.*

WATERBURY BRANCH

On Friday, December 9th, the Waterbury Branch of the American Electroplaters' Society, held a meeting at the auditorium of the Connecticut Light and Power Company, Waterbury.

Mr. R. H. McCahan spoke on "High Speed Copper Plating."

The meeting was attended by 88 members and guests.

Mr. McCahan gave a resumé of copper plating and showed the advancements that had been made with the introduction of this new plating solution. After he finished with his talk questions were asked from the

floor for fully as long as his talk required. From his talk it was apparent that this new copper plating bath has accomplished several things. First, it has increased the current efficiency from around 30% to 100%. Secondly, it increased the permissible current density by at least three times. Third, it is possible to produce thick deposits in the order of .030", and fourth, it is possible to produce a bright copper deposit which would be a good base for bright nickel plating.

An application for membership was received from Mr. Frank M. Tutolo.

E. T. CANDEE, *Sec.*

NEWARK BRANCH

The regular meeting of the Newark Branch, A.E.S., was held on Friday evening, November 4, 1938, at the Club Room of the Hotel Douglas, Newark, N. J.

The meeting was called to order at 8:30 p.m. The following officers were present: John Kotches, President; George Wagner, Sec.; Paul Oldam, Librarian; Stephen Leshnick, Sarg.-at-arms; William Harrison, Harmon S. Hunt and George Reuter, Trustees. The minutes of the previous meeting were read and approved.

A communication was read from the American Electrochemical Society inviting Newark Branch to attend a meeting on November 18th at Havemeyer Hall, Columbia University. Some of the members have promised to attend this meeting, but due to the fact that this meeting falls on the same date as our regular meeting, it could not be arranged to make a group visitation.

The following candidates were voted on and elected as follows: To Active Membership (1) Stephen Goda, (2) Jules Homa, (3) William F. Spear. To Associate Membership (1) Raymond Dooley, (2) S. O. Krivit, (3) Siegfried G. Bart, (4) Stanley Harris, (5) John R. Bricker. Mr. Nick Milo was reinstated to Active Membership.

Under reports of Committees, Mr. Horace H. Smith and Mr. George Wagner, reported that plans had been completed for the Bingo scheduled for Nov. 15, 1938, at the Mosque Ballroom, Newark, N. J., and also the Bus Trip to attend the Philadelphia Educational Session and Banquet which will be held on the 19th of November.

Mr. Paul Oldam, our Librarian, next presented Dr. Walter R. Meyer who gave us a very interesting talk on "The Role of Metals as Brighteners and Impurities in Plating Solutions". His talk was accompanied with numerous slides and a resumé of this paper will be forwarded to the MONTHLY REVIEW for publication. Dr. Meyer

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was given a rising vote of thanks by the 55 members present. Meeting adjourned at 11 p.m.

GEORGE WAGNER, *Sec.*

LOS ANGELES BRANCH

The regular monthly meeting of the Los Angeles Branch of the American Electroplaters' Society was held November 9, 1938, at the Rosslyn Hotel.

President Earl Coffin presided.

Minutes and financial report of the previous meeting were read and accepted. Bills were read and ordered paid.

Mr. Vasquez obtained some very fine educational talking pictures which received a big hand from all present.

The following men were elected members of the Los Angeles Branch: Mr. B. H. Schindler, Active Member; Mr. B. W. Armstrong, Active Member; Lawrence A. Smith, Associate Member; Harold J. Kroesche, Associate Member; J. A. Warren, Active Member.

The following questions were found in the question box:—

Q. How much metal per gallon should be used in a barrel type nickel solution? What is the best voltage?

A. The nickel content should be double that of a still solution. Six volts are used in most cases.

Q. Would like to know about Tungsten-Tantalum plating and where to obtain chemicals for such a solution.

No answer was obtained.

Meeting adjourned at eleven p.m.

RAYMOND SOLIVAN, *Sec-Treas.*

NEWARK BRANCH

The regular meeting of the Newark Branch of the A.E.S. was held on Friday evening, November 18th, at the Club Room of the Hotel Douglas, Newark, N. J.

The meeting was called to order at 8:30 p.m., by President John Kotches. Other officers present were: Mr. George Wagner, sec.; Nelson Sievering, treas.; Paul Oldam, librarian; William Harrison and Harmon S. Hunt, trustees.

The minutes of the previous meeting were read and approved.

A communication was read from Mr. George B. Hogaboom, Chairman of the Research Committee, in which he requested that the Branch appoint three members to co-operate with the Research Committee to investigate some of the smaller problems which are brought to their attention, occasionally. Mr. Philip Sievering, Mr. Harmon S. Hunt and Mr. Robert R. Sizelove were appointed to act on this committee.

The secretary reported that he had received a personal letter from Mr. Robert Sinclair, Staffs, England, in which he mailed his dues as he wishes to remain a member of Newark Branch. He stated that he had held four positions since he reached England about a year ago and that at each new position he had bettered himself. He asked to be remembered to all the boys of Newark Branch.

An invoice for per capita tax was read and ordered to be paid.

Under reports of committee, Mr. Horace Smith and Mr. George Wagner reported that the joint bingo held at the Mosque Ballroom on November 15th turned out very successful. They expressed their appreciation to the members for their loyal support. Proceeds of the affair are being donated to the Ladies' Committee for the Convention.

Mr. Paul Oldam presented as the speaker for the evening Mr. Nathaniel Hall, who gave a remarkably interesting talk on the deposition of non-metallics, such as are used in the manufacture of electrotypes. His talk included the manufacture of Copper

Screens deposited on plates, a stop-off being used for perforations. Mr. Hall exhibited numerous samples which were deposited in that manner, some of which had holes so small, that it was necessary to hold them against a light to detect the perforation. Mr. Hall was given a rising vote of thanks by the 42 members who attended this meeting.

Meeting adjourned at 10:30 p.m.

GEORGE WAGNER, *Sec.*

GRAND RAPIDS BRANCH

Our November meeting was called to order by President Charles O. Werft and the minutes of the previous meeting were read. A good attendance was enjoyed, many of our new members being present. We had made this night open house so we also welcomed several visitors.

Our President gave a short talk on the dinner and educational Session we are holding December nine. The dinner is to be served at 6:30 P. M. and will be followed by a short talking movie. The speaker for the evening is to be H. W. Kennedy of the duPont Co., who will speak on "Rapid Copper Plating". Following the talk there will be entertainment. Tickets were given out to all the members. The price is $1.50 per person and an attendance of approximately 125 persons is expected.

Mr. M. R. Caldwell told the boys about the Dinner Dance and Educational Session to be put on by the Detroit Branch December ten. Many of our members expect to put in a full week end by attending our own as well as the Detroit Branch affair.

The Question Box, conducted by our Librarian Homer G. Morton, contained the following questions:-

Q. Have any of our members had any experience with the new High-Speed Dupont Copper Plating Process?

A. Three of our members are putting in installations but we deferred any discussion till a later meeting.

Q. What causes plate to go on rubber lining of nickel tanks?

A. Porosity and the presence of minute metallic particles can cause plate to be deposited on the rubber. The point was brought out that only certain type of rubber lining are suitable for bright nickel solutions and it is

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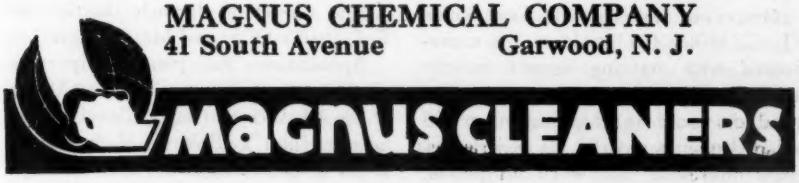

well to consult the company whose bright nickel you are using before buying a rubber lined tank.

Q. Why does a glass lining have to be used in a chromium plating tank?

A. One member said he had never used glass lining in his chrome tank. It is true that the glass lining is not absolutely necessary if it is certain there are no shorts and the anodes and cathode racks are far enough away from the sides and bottom of the tank. However, the tank does not actually have to be in the circuit and it can be made the anode or cathode by induction if the above precautions are not followed. Many people use the glass lining as a safety measure.

Q. What causes poor throwing power in nickel solutions?

A. In an ordinary dull nickel solution, poor throwing power will be encountered at too low a pH, too high temperature, or too low current densities. Bright nickel solutions will lose throwing power due to other causes; close control must be maintained and impurities kept out.

After the Question Box, Mr. Bradley of the Oakite Products Company was introduced. He read a very interesting paper on "Metal Cleaning Prior to Electroplating", which will be published later on in the REVIEW.

We were lucky to have Mr. H. W. Kennedy present at our meeting. Mr. Kennedy is with the Dupont Co., and is a member of Detroit Branch. He spoke a few words in regard to his forthcoming Educational Session talk of December nine.

One of our members, Mr. Chet Smith (J. C. Miller Co.), told of his experiences with wetting agents in the kitchen. He tried some of the pure products as aids in whipping cream and salad dressings. Altho his experiences were interesting and even humorous, he stated his efforts brought him exile from the kitchen.

CHAS. S. WHALLEY, *Sec.*

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CLEVELAND BRANCH

The regular monthly meeting of the Cleveland Branch of the A.E.S., was held Sat. Nov. 5, 1938 at Hotel Cleveland at 8:30.

Meeting called to order by our President Mr. Matts.

Mr. Oplinger of the E. I. duPont Co., gave a very fine talk on "Copper Plating". This was an open meeting and was well attended.

The Cleveland Branch thanks the E. I. DuPont Co., and Mr. Oplinger.

Application for membership was made by the following:-Stephen Miller of the Advance Plating of Cleveland, O. active; John T. Bohovic of the Royal Brass of Cleveland, Ohio active; Ray-

mond Hoffman of E. I. DuPont de Nemours & Co., associate; Charles A. Carrich of Cleveland Welding Co., of Cleveland active; L. M. Morse of Eaton Mfg. of Cleveland, associate; Michael E. Kilroy of Eaton Mfg. Co., of Cleveland, associate.

The following members were elected: John S. Hoffman of Udylite Co., associate; E. E. Binder of Puro Chemicals Inc., associate; W. W. Woodruff of Eaton Mfg Co., associate; Alfred J. Krause of Murry Ohio Co., active; Paul R. Pine of the Harshaw Chemical Co., associate; H. E. Beshey of Shelby Spring Hinge Co., active; Shelby Ohio. Edward C. Friedl of E. I. duPont de Nemours & Co., associate.

Members will be notified of next months speaker.

Meeting adjourned at 10:00 o'clock.

CHAS. F. OTT, *Sec.*

ROCHESTER BRANCH

The Rochester Branch held its regular monthly meeting at the Seneca Hotel on Friday night, Nov. 18. Meeting was called to order by Pres. Del Rosso and regular business was transacted during which Mr. Art Moore, chairman of the Bowling Party committee, reported everything in readiness for a rip roaring party. After the regular business meeting the session was turned over to Mr. Frank Dougherty, the Educational Chairman who started some discussions which lasted for quite some time after which the meeting was adjourned.

On Saturday night, Nov. 19th, the Rochester Branch held its regular Annual Bowling Party and Funn Night at the Pines Bowling Hall. The party was very well attended, some 60 members and friends coming out to make this another big success. Two members of the Buffalo Branch braved the weather to come down, bringing their ladies with them, they were Mr. and Mrs. Boy and Mr. Joe Ruff and his lady friend. This party was distinguished by the fact that everyone went home with some sort of prize not one losing out. A big vote of thanks is due the committee headed by Mr. Art Moore for a very successful party.

JUDSON R. ELSTER, *Sec.*

DETROIT BRANCH

Minutes of meeting held Nov. 4, 1938, at Hotel Statler at eight p.m.

Mr. J. W. Higgins, president, presiding. There were 125 members and guests present. The minutes of the previous meeting were read and approved. All bills ordered paid. Ten new applications were reported on favorably by the Board of Managers and they were unanimously elected to membership. Thirteen new applications were read and referred to the Board of Managers to be reported on at the next meeting.

Mr. H. M. Cherry, Chairman of the Entertainment Committee, asked Mr. Wm. McCord to give a report of progress on arrangements for our Second Annual Educational Meeting—Dinner and Dance, to be held Saturday, Dec. 10th. Mr. McCord announced that reservations for tables can be made for groups of ten persons per table. Reservations will not be held over one-half hour after the opening of the banquet room. Anyone wishing a reserved table should contact Mr. Geo. L. Nankervis of F. B. Stevens and Company who can give any detailed information desired. Mr. Nankervis stated that the entertainment program and dinner were well in hand and that the ladies' favors will be something to write home about.

Mr. C. H. Eldridge reported that the educational program for the meeting was complete and the three

speakers provided will all be of unusual interest.

The President then introduced the speaker of the evening, Dr. Kenneth Graham, Consulting Engineer, Jenkinstown, Pennsylvania. Dr. Graham spoke on "Anode Polarization in Alkaline Plating Baths", illustrated with slides. His talk was extremely interesting as well as instructive, and the applause and discussion after the paper showed the keen interest of every one present.

Mr. B. F. Lewis then took charge of the Question Box and quite a few questions were read and answered.

The secretary announced the receipt of the new Constitutions stating that they will be mailed to the members during the month. He also announced that this is the last meeting that he would have copies of the Proceedings of the Convention for the members, but that they can be had by either picking them up at his home address or by sending the postage to his address. Ten cents for the city and seventeen cents for out of town.

Q. Is it possible to recover copper from a chromic acid solution which has been used to strip copper from steel?

A. It is not possible to remove the copper, but the effectiveness of the chromic acid solution for stripping copper can be restored by small additions of sulphuric acid.

Q. Please give method and solutions necessary for cadmium plating of terne plate.

A. Use a mild cleaner for degreasing and scour wet with fine abrasive. Plate in the usual cyanide cadmium bath.

Q. What cleaning methods should be followed in bright nickel plating over

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brass to prevent stains showing through nickel plate?

A. Stains may be from insoluble dirt remaining after cleaning. If a degreaser is used, the work should be wiped before cleaning in the electro-cleaner. If no degreaser is used, the work should be swabbed in the alkaline cleaner. If the stains persist, they may be due to incomplete rinsing in the operations prior to plating.

Q. What can be used besides caustic soda for adjusting the pH of a copper bath?

A. Caustic is best for raising pH; tartaric acid or bicarbonate of soda for lowering pH.

Q. For what purpose is sodium perborate added to a copper bath?

A. Perborate will accelerate solution of polarization films on copper anodes, and also floating particles of such films. When these films are the result of excessive additions of sulphur compounds as brighteners, the perborate will destroy the excess.

Q. When testing a plated article in a salt spray, does it make and difference in results whether the article is suspended vertically or inclined at an angle?

A. If the spray is dense and wet, no difference will result.

Meeting adjourned at 10:30 p.m.

T. C. EICHSTAEDT, *Sec.-Treas.*

PHILADELPHIA BRANCH

Meeting was called to order by Pres. Joe. E. Underwood, presiding. Roll call of officers showed all present. Pres. Joe. E. Underwood called upon Executive Secretary W. J. R. Kennedy, who gave a brief resume of the work being done by the various branches and the healthy condition of the Supreme Society in general; he also stressed the reason for the branches supporting the coming International Convention at Asbury Park, New Jersey; the host being Newark Branch, the work the various committees are doing to put this Convention over; and should be supported by every member of the society, by active participation and attendance; also by trying to have an exhibit of the work they are doing. The branches should also get busy with a paper. Moved and seconded that Mr. W. J. R. Kennedy be given a rising vote of thanks. Carried. The minutes of the previous meeting were read and approved. Applications of Mr. George Racine, active member; Mr. Arthur Snow and Mr. John C. Mylin as associate members referred to Board of Managers. Communication from Research Chairman Mr. George Hogaboom read, moved and seconded that same be laid over till next meeting, carried. Moved and seconded that Phila. Branch hold its meetings for the rest of the fiscal year at Hotel War-

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wick. After a discussion the motion was lost. Phila. Branch to hold its meetings at Harrison Lab., U. P. 34th and Spruce Streets, Phila. Communication from Supreme Pres. W. M. Phillips and Third Vice-Pres. Joseph L. Downes, regretting their absence at the Educational Session and Banquet read, moved that same be placed on file, carried. Banquet committee reported everything in readiness for the best event to be held at Philadelphia.

The meeting was then turned over to Librarian E. J. Zurbach, who introduced Mr. L. A. Critchfield of Hamilton Watch Co., Lancaster, Penna., foreman and chemist. The speaker held the interest of all present with the display of time-pieces and the various methods of keeping time with a very enlightening lecture, showing also the methods of finishing problems involved in handling the very small parts that are used in the various watches. Moved and seconded, Mr. L. A. Critchfield be given a rising vote of thanks also the Hamilton Watch Co. who made this exhibit and lecture possible, carried.

Librarian E. J. Zurbach, Jr., informed that branch that Dr. A. K. Graham will give a very interesting talk at one of our future meetings. Do come out and hear the facts.

There being no further business the meeting adjourned until December 16, 1938, 8:00 p.m. at Harrison Lab, U.P.

Hotel Warwick Educational Session started promptly 2:00 p.m. Speakers: Dr. Daw, with a practical demonstration of barrel plating; Mr. George Hogaboom, "Production Methods of Special Finishes"; Mr. Floyd Oplinger, "Copper Plating"; Mr. W. J. R. Kennedy, "What the A.E.S. is to the Plater"; Mr. Horace Smith of Newark Branch called attention to the coming International Convention at Asbury

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Park, its advantages to the Plater and the Manufacturer which was received with a great ovation and the slogan "On to Asbury Park, June 18-22, 1939". Attendance at Educational Session 273 at the dinner 325, which was enjoyed by all.

Frederick V. Verrelle, former member Phila. Branch, passed away on Friday evening, Nov. 18, 1938, at Fairfield, Conn., He was employed at the Dictaphone Corp., Bridgeport, Conn. He leaves a wife and two daughters and one son, Nat. Verrelle, of Phila. Branch.

Mr. Al Hirsch will be the speaker in February and as usual will have a very interesting topic at that time.

Philadelphia Branch members out of employment register with Sec. Robert E. Jackson, Jr., as there have been inquiries.

ROBERT E. JACKSON, JR., *Sec.-Treas.*

BUFFALO BRANCH

On October 17th the Buffalo Branch of the A.E.S. held it's monthly meeting at the Stratford Arms Hotel. We were all shocked to hear of the recent death of Mr. W. A. Guy, Sr. Expressions of deepest regret that one so popular and well informed in the plating industry should be taken from amongst us so suddenly were voiced by many of the members. An appropriate floral tribute was sent by the branch.

Mr. W. Phillips, Head of General Motors Plating Dept., and guest speaker of the evening by means of slides and moving pictures held the attention of the society in a highly informative but humorous address. Questions were asked and were answered by the guest speaker in a most capable manner.

Mr. Philips also commented briefly on the future of the Plating Industry, and expressed surprise that such a new society should be able to boast such a large membership.

W. HART, *Sec.*

TOLEDO BRANCH

A regular meeting of the Toledo Branch, of the A.E.S., was held on December first at the new Vocational High School, with 23 members and two visitors present.

The meeting was called to order at 8:15 o'clock by the President, Stanley Moore; the minutes of the previous meeting were read and approved.

At this time the Chairman introduced

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Mr. Victor Miner, who read a very interesting paper on rectifiers, and who in turn introduced the next speaker, Mr. Bore from the Westinghouse Co. of Pittsburgh, Pennsylvania. He explained in detail the construction, installment, operation, and the advantages of rectifiers over motor generator sets. Mr. Bore answered many questions pertaining to rectifiers in general, and in particular as to their use in the electroplating field, to the satisfaction of all concerned. At the close of the talk the speakers were given a vote of thanks by the members, for their contribution toward the advancement of knowledge in the art and science of electroplating, and the chairman instructed the secretary to send a letter of thanks to the Westinghouse Co. for their splendid co-operation in furnishing us with a very interesting paper, and express our appreciation for the privilege of having had Mr. Bore with us as our guest.

Action on a letter from Mr. Hogaboom, requesting the appointment of a committee of three to co-operate with the research committee at the Bureau of Standards, by doing some local research work at their own plants was tabled until the next meeting.

A motion by Mr. Hale that the society should not buy any tickets for the Detroit Banquet, and since all the members going already had tickets, the secretary should return the tickets sent him, was seconded and passed.

At the request of several members it was decided to try and get Mr. J. W. Dammers from the Blakeslie Co. to speak at our next meeting, on the subject, "Degreasers, and Sprayer Washing Machines".

After having decided to make arrangements to hold our meeting in the new Vocational High School, a motion was made by Mr. Moore, and seconded by Mr. Gerity, that the secretary send a letter of appreciation to Mr. Michael Spanolis for having had the privilege of meeting in his office and home, and thank him for all the courtesies extended to us during all that time. The motion was passed unanimously. There being no further business, the meeting adjourned at 10:30 o'clock.

GASTON BERGEMANN, *Sec.*

MILWAUKEE BRANCH

The 293rd regular meeting of the Milwaukee Branch of the A.E.S. was held at the Republican Hotel on Thursday evening, December 1st, 1938.

Roll call of officers found them all present. Minutes of the previous meeting were read and approved.

A communication from Mr. Paul Oldam was read in which he asked that

a Chairman for the Plated-Ware Exhibit be appointed for the Branch for the coming 1939 Convention. Mr. Henry Bornitzke was given the honor.

Also a letter from Mr. George B. Hogaboom was read. Mr. Hogaboom requested that a committee be selected to carry on Research Work in their own plants. Plans would be outlined for them at a later date. The Committee is composed of Vincent Sheehan, Phil Ritzenthaler, Henry Bornitzke, William Geissman and John Miszewski, Jr.

The Detroit Branch sent an announcement in regard to their Educational meeting and banquet. Mr. Ray Goodsell will represent the Milwaukee Branch.

The motion was made and seconded that all bills be allowed.

The question arose as to whether the Milwaukee Branch will hold a banquet or smoker this year. There were a few choice remarks in behalf of each but it seems that the majority are in favor of a banquet this year. However, there is still plenty of time to think of it so the question has been laid over for the next meeting in January.

The meeting was then turned over to the Librarian, who introduced Mr. Vincent Mattacotti of Hanson-Van Winkle-Munning. His subject, "Purification of the Plating Bath", was a timely message and was well received by the members. After delivering his message, Mr. Mattacotti was kept very busy in answering questions. He was given a rising vote of thanks by all.

The last meeting of the year was attended by 35 members and several guests. Everyone agreed, when the meeting adjourned at 10:00 p.m., that we had one of the finest educational sessions ever held.

ROBERT B. GOODSELL, *Sec.-Treas.*

ST. LOUIS BRANCH

Our of respect for our late member, Frank E. Terrio, passing away, our regular meeting in November was postponed.

In view of the large amount of business to come up, a special meeting was called on a later date, so that the large amount of applications that were pouring in could be taken care of.

Meeting was called to order by Rickett (Pres.). Applications of new members were read and turned over to Board of Managers to be acted on at the next meeting.

Motion made that a committee be appointed to draw up a resolution to be sent to the family of Mr. F. E. Terrio and a copy be spread on the minutes.

Mr. H. H. Williams and H. J. Richards will act on that committee. No further business, meeting adjourned to meet on December 9, 1938 at 6:15 p.m.

Regular meeting of the St. Louis Branch, A.E.S., was held on Friday, Dec. 9, 1938, at Central Y.M.C.A.

Dinner was served to 20 members. Roll call showed 1 absent. Minutes of special meeting were read and approved.

Letter was read from Research Committee asking that three (3) men be appointed to co-operate with research committee. Mr. John Vogt was appointed chairman, H. Lubker and Chas. T. McGinley to assist. Letter was read from P. A. Oldam in regards to exhibits at the Annual Convention. Mr. A. Barth was appointed chairman.

Next order of business, election of members. Board of managers had what looked like a book, but which turned out to be applications that had been O.K.'d by them at a special meeting. Secretary then read all, and after finishing had 25 applications.

Chairman Musick sure is to be commended on the work he has done in securing 25 applications, and put St. Louis over the top as our quota was 18.

Asked Mr. Musick how he did it. Well, you just tell them about the benefits you receive when you belong to the A.E.S. and they hand over that $5.00.

Meeting then was turned over to John Vogt, our librarian, who in turn called on H. Lubker who gave a talk on cleaning cycle in job shop, and quite a number of questions were asked, which he answered. Had a blackboard and all operations drawn out so that everyone could understand. Told of the treatment for brass, steel, and die cast.

John Vogt then explained how he cleaned the work before going through the automatic plater.

Both talks were enjoyed by all present, so do not miss the next meeting.

Subject will be "Replating Rejects". Sounds interesting.

CHARLES T. MCGINLEY, *Sec.*

NEW YORK BRANCH

The New York Branch held two meetings during the month of November, at their headquarters in the Hotel Pennsylvania.

The first meeting of Friday, November 11th, was featured by a lecture given by Mr. Edwin C. Rinker of the Oakite Products Company, entitled "Modern Electroplating Practice on Novelty Jewelry", an interesting and comprehensive presentation of methods for producing novelty finishes. Mr. Rinker spoke for an hour and a quarter and afterward answered many questions relative to the subject. The Branch extended Mr. Rinker a rising vote of thanks for one of the most interesting talks before the Branch in recent times.

The second meeting of Friday, November 25th, was a business meeting followed by a discussion on plating problems for research and investigation for the half year to come.

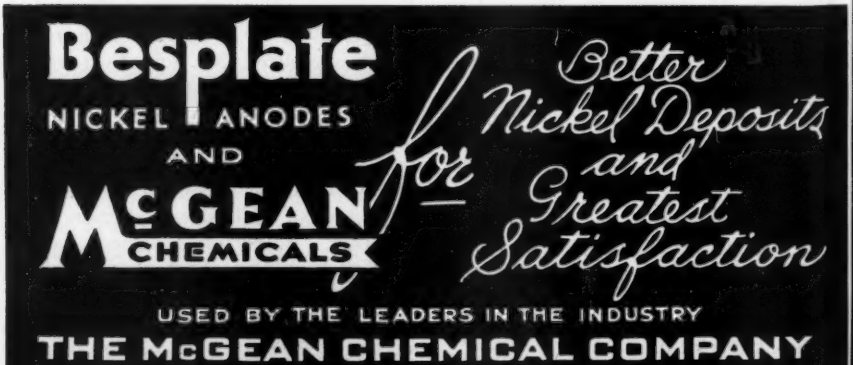
There were three applications for membership and two elections at these meetings.

The meetings were adjourned at 11:30 and 11:00 o'clock respectively.

F. J. MACSTOKER, *Sec.*

SPRINGFIELD BRANCH

The regular monthly meeting of the Springfield Branch A.E.S. was held at



the Hotel Charles on November 28th at 8:00 p. m. The minutes of the last meeting were read and approved. A communication from Mr. George Hogaboom, chariman of the Research Committee was read and commented on by Mr. Kennedy and Mr. Hogaboom. Messrs. Hastie, Seidel, and Copp were appointed to conduct the investigation work which will be suggested by the committee. The per capita tax bill was read and voted paid. The following applicants were accepted: Mr. A. Copp, active, Moore Drop Forging Co.; Mr. A. W. Wood, associate, Westinghouse Electric & Manufacturing Co.; and Mr. W. Clark, associate, International Chemical Co.

Mr. Prouty gave a report for the committee appointed to consider the possibility of preparing a paper for the 1939 Convention at Asbury Park. After the discussion it was decided that the Springfield Branch would prepare and present a paper on the comparative results so obtained by measuring the throwing power of a rochelle salt copper solution with the haring cell, bent cathode, and closed tube. Twenty-five dollars was allotted the committee for expenses. The following members were appointed to prepare the paper: D. S. Hartshorn, Jr., Chairman, P. W. Prouty, A. W. Wood, and H. Delarm.

Mr. C. Hastie's membership, transferred from the Hartford Branch was received and accepted. A motion was made and seconded that the December meeting be held on the 19th instead of the 26th because of the holiday conflict.

Mr. George B. Hogaboom was the speaker of the evening. His subject was "What Do We Know", and he very ably convinced us that there are more things that we do not know about plating. Some of these are ionization, throwing power, and anode and cathode polarization. He explained the application of electrodeposits of iron, platinum, ruthenium, and tungsten, explained that palladium, a member of the platinum family and at present a drug on the market would pay big dividends to the person who could find an application for it's use.

After his talk Mr. Hogaboom answered the following questions:

Q. What is the value of phenolsulphonic acid in the acid copper tank?

A. Phenolsulphonic acid causes hard and dense deposits, but the material oxidizes to hydroquinone and produces poor work.

Q. What is a good method for stripping nickel from steel?

A. A concentrated solution of sodium nitrate with reversed current is being used with excellent results in several plants.

Q. How is it possible for calcium to remain in a nickel sulphate solution?

A. A nickel solution containing chlorides may hold a considerable quantity of calcium in solution as calcium chloride.

Q. How may hydroquinone be removed from an acid copper solution?

A. No effective method for its removal has yet been discovered.

S. *Will friction tape which has come in contact with a bright nickel solution cause cloudy deposits?*

A. It certainly will. It may be removed by additions of hydrogen peroxide and filtering through activated carbon. Do not mix the activated carbon in the tank because it will be difficult to filter and will cause rough deposits until removed.

Mr. Hogaboom's interesting talk was thoroughly enjoyed and he was given a rising vote of thanks.

The meeting was adjourned at 10:45.

D. S. HARTSHORN, JR., *Sec.*

MONTREAL BRANCH

The regular winter series of meetings opened on the last Thursday of Sept., when plans for the coming season were discussed. Following the suggestions made at that meeting, the October gathering commenced at 6:30 p.m. at the New Carlton Hotel on the regular fourth Thursday of that month with a supper followed by a regular business and educational session. The chief topic was on the subject of Rochelle Cyanide Copper Solutions. Mr. H. S. Jordon leading the discussion, and taking considerable pains with his explanations of the various points raised.

This supper preceding the meeting is a new departure for this branch and received such favorable comments that it was decided to repeat it at the next meeting in November.

Through the good services of Mr. John H. Feeley, we had as our guest and speaker for the evening, Professor J. U. MacEwan, professor of mining and minerology at the McGill University who addressed the meeting on pH. The method used by Professor MacEwan to present his subject was so direct, so logical and to the point that no member present could have failed to get a very clear grasp of the subject. Why the so-called weak acids, such as boric and citric have buffer action and can hold a certain pH for prolonged periods was carefully explained. The reasons why a neutral solution is described as pH7 whilst increasing acidity carries decreasing numbers and increasing alkalinity carries increasing numbers was given attention without going too deeply into logarithms.

The few members who missed this lecture, have something to regret.

This was Professor MacEwan's first contact with the A.E.S. and we most sincerely hope that it will not be his last.

J. T. CRONIN, *Sec.*

TORONTO BRANCH

The meeting of Toronto Branch was held on Nov. 28. In the absence of President Acheson, Vice-President Archie Smith occupied the chair with Jack Walker acting as Vice-President. 26 members answered the roll call. One application for membership, and two balloted on and added to the roll. Chairman Smith welcomed the new members from Hamilton. After the usual routine of business, Mr. George Hogaboom's letter of Research

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Activities was discussed and the following members promised to cooperate with Mr. Hogaboom's request: Mr. A. Smith, H. Bird, M. Phillips, W. Price and Colin Turner. Letter was read from Mr. Johnstone of London, Ont., requesting information about automatic tube polishing machine and the letter will be taken care of. Next came the grand display of plated articles. 26 pieces plated by the members present and all giving their version of method of proceedure. Looking at this display the plater could not help feeling proud of his profession, and would dare anyone to suggest the use of paint on articles such as were on display. Gold plated chains, brass, chrome and bronze colored lamp bases, bathroom fittings in chrome, bottle tops in bright nickel, ice figure skates in chrome, and roller skates in nickel, with base metals of brass, zinc, antimonal lead copper and steel. The talk and discussion lasted 1½ hours, and was well worthwhile, Charlie Kemish and his samples being the centre of interest. Owing to the late hour, the question box was held over till next meeting which will be in January.

JAMES S. CAIRNS, *Rec. Cor.*

PROVIDENCE-ATTLEBORO BRANCH

The Providence-Attleboro Branch held its regular meeting on Nov. 21, 1938 at the R. I. School of Design. From 6:30 to 8:00 a group numbering 15 had supper in the Indian Room of the Narragansett Hotel; members of the party were: Mr. Geo. B. Hogaboom, and Mr. Frank Clark, of the Hanson-Van Winkle Co; Mr. Chas. C. Chace of the Gorham Co.; Mr. Donald Wood, and Mr. John McLean, of the Reed-Barton Co.; Mr. Wm. McDonald and Mr. Ballou, of the Geo. L. Claflin Co.; Mr. John Hutchinson, of the Dupont Co.; Mr. Wm. F. Cahill, of Munning & Munning; Mr. Arthur W. Wood, of the Fulford Co.; Mr. Blake, of the Storts Welding Co.; Mr. James Potter, of the Dunn Bro's.; Mr. Buckley, and the Secretary and Mr. Mark Weisberg.

At eight the party started for the meeting room, and at 8:30 the meeting was called to order and Mr. Rollings of the school management, after a few remarks of welcome, turned the meeting over to Mr. Chace.

Mr. Chace called on several men in the audience, and received brief responses from them, and then he introduced the speaker of the evening, Mr. Geo. B. Hogaboom.

The speaker reviewed the history and progress of Electroplating for the past 25 years, contrasting what is being done today with what was possible 25 years ago; illustrating how some things were discovered by telling the story of a mule tethered somewhere in Idaho and pawing into what proved to be a zinc mine.

Among the things being done today, George cited: A plant at Sparrows Pt., Md., that deposits zinc directly from the ore, using a tank 100 ft. long and a generator with a capacity of 40,000 amps.

Records made in acid copper solution with a C.D. of 1000 to 1500 amps per sq./ft.: 4 hours after a football game one may listen to a record of the game. A plant in Gary, Ind., in which the men stand in line 15 ft. apart, and the line is 2 ft. short of a mile. Cadillac cars are coming out with a specified thickness of plate. At the present time the tin plating is receiving much attention; can manufacturers are planning to tinplate a sheet of steel, strip it to size and run it directly into the can -

forming machine. George said that Bright Nickel has come to stay. Stainless steels will never replace electroplate.

George then opened up the Question-Box.

Q. How is the brightness of Rochelle-salt Copper deposit increased?

A. By adding 1/32 oz. of hypo per gal.; maintain temperature at 140°.

Q. Do you believe that rectifiers have an advantage over generators for jewelers' use?

A. To a limited extent the rectifier is equal to the dynamo but, beyond that the dynamo has the advantage in long life and endurance.

Q. What is the best way to test Phosphoric acid-Rhodium solution?

This was referred to Mr. Mark Weisberg; The way to do is to titrate with 1/10 normal caustic soda.

For Nickel-plating on Nickel-plate: The old plate is passive and must be activated by making it the cathode in a sulphuric acid bath of 320Bé for a few seconds.

George explained the work of the Research Committee of which he is Chairman and stated that he is calling on all branches to co-operate and appoint committees for that purpose.

Mr. Joseph Smith, director of the class in Electroplating at the school, invited the members to inspect the outfit.

We adjourned about 10:30. There were 55 present. J. ANDREWS, *Sec.*

BRIDGEPORT BRANCH

The November meeting of the Bridgeport Branch was held on Thursday, Dec. 3, in the Chamber of Commerce rooms at the Stratfield Hotel. There were eighteen members present. Joseph Sterling, president, presiding.

The Roll Call of officers was read: Ray O'Connor, William Thompson and Dr. Walter Meyer were absent.

The minutes of the last regular meeting were read and accepted.

The Sick Committee reported Geo. Karl ill with the grippe.

A communication from the Newark Branch was read and a Committee on Plated Ware was appointed.

A communication from the Detroit Branch concerning an Educational Session and Banquet was read and placed on file.

A communication from Mr. Geo. Hogaboom of the Research Committee was read and a local Committee was appointed to co-operate with this group, namely, Joe Sterling, Clarence Hlemle, William Ehrencrona, John Charleson, Carl Schaeffer and Robert Reid.

Application and balloting for membership, none.

The first meeting of the 1938-39 Chemistry Class was held on Thursday evening, December 8, at eight o'clock. There were twenty one men present and it is expected that the class will increase. Until after the first of the year the meetings will be held on December 15, December 29 and January 12, from then on the group will meet every two weeks, with the exception of the first Thursday of each month which is a regular meeting night. Non-members are welcome to this class as well as members of any plating Branch.

On Friday, January 20, an Open Meeting will be held at the Stratfield Hotel for members and their friends when Mr. Ralph McCahan of the Electroplating Division of the E. I. Dupont de Nemours Co. will speak on Cyanide Copper-plating.

Receipts of the session, none.

The remainder of the meeting was turned over to an Educational Session when talks were given on Plating Solutions and Cleaning.

Meeting adjourned at 10:30.

WM. H. FLAHERTY, *Sec.-Treas.*

Here and There

On Saturday evening, November 26, 1938, the Milwaukee Branch A.E.S. held a party at the Elk's Club for the members and their wives. The party started full swing about 9 P.M. Dancing was enjoyed by both the young and old. The refreshments, which have made Milwaukee famous, were pleasing to the palate.

The music was furnished by a band that has as one of its members, the son of our 1st Supreme Vice-President. So you can well imagine that Ray Goodsell would have a good time by just having the satisfaction of seeing his son in action. Some boy, this Ray, Jr. And these proud fathers!

A buffet lunch was served, in which everyone really did justice to.

The entertainment for part of the evening was also furnished by that spectacular headliner and entertainer, Jack Geissman. He made a grand Master of Ceremonies, as we all can recall from the past Convention this summer.

Rodney Olsen gave us a demonstration of his vocal ability and it is the opinion of many, that he is wasting his time as a plater. Then Jack called on the old timers to give us a song. They also proved that the Platers have marvelous voices.

Dan Wittig and Bob Steuernagel showed the young folks how to do one of the latest dances, namely the "Jitterbug". How those boys can step. Speaking of the "Jitterbug", Mr. H. C. Jaeger had his two daughters there and they really made a big hit by their ability to dance the "Jitterbug". And before the evening was over, they had everyone else doing the same thing. Which just goes to show, as Ray Goodsell puts it, how contagious these latest dances really are.

The only complaint that was made, and I believe was unanimously shared, was that the evening came to a close all too soon. But to promote the best of feelings in the Branch, there is nothing that will equal a good get-together for all members and their wives. That is the only way to get acquainted with all.

REMINDER

Our friends all tell us that the Warwick meeting was the most successful, both as regards the educational program, the banquet and the show, ever held by the branch and apparently there are no unfriendly friends or some adverse criticism would have been heard. From the experience gained by the unpreparedness for nearly one third more than expected, better plans can be laid for the next meeting to obviate this trouble; but it must be admitted, the Warwick management admirably arose to the occasion and made a distinct win from what appeared a losing battle.

The innovation of a ladies' committee was very pleasurably received, both by the localites and the visitors, many of the latter stating unqualifiedly that they enjoyed the Philadelphia arrangements much better than some national conventions.

That about ends the bouquets, while from those in closer contact with the behind scenes manipulations, it must be admitted that much room for constructive criticism remains in spite of the now assured fact that no loss will be experienced by the treasury and perhaps a slight increase will be the final outcome.

At the Friday evening meeting, Mr. Critchfield surprised his fellow members by the novelty and interest of his talk as well as the samples of his trade; which only goes to prove the statement frequently made in these pages, "If you do something commonplace to you but have never seen it so done elsewhere, it is owing to your fellow members to tell them about it and without fail their interest will be aroused and held during the telling". Mr. Kennedy was so enthused that he is recommending Mr. Critchfield's talk for the June convention, and has so told the Newark Educational Committee.

By the majority vote at this meeting the decision was made to return to the University of Pennsylvania for future meetings this year and it now behooves those favoring this return to produce the same attendance as at the hotel, namely 39 in October and 48 in November, for it is only by having such attendance that worthwhile speakers may be induced to appear.

In this connection, Mr. Zurbach says "We all know what happens at the cathode but few realize what takes place at the anode", and since both are necessary to plate he has secured Dr. Kenneth Graham to speak on Anode Reactions at the December meeting, which has been moved forward, because of the holidays, to the third Friday, the 16th. Everyone come out to hear Dr. Graham release some as yet unpublished work on the anode at the Harrison Laboratory, 34th and Spruce Streets.

It would be discourteous to close without expressing the thanks of the branch to the sixty suppliers and individuals supporting this event with door prize and favor contributions.

A thank-you card was attached to each prize and it is hoped the winner in each case promptly filled in and mailed this courtesy reply, while for those giving favors, please accept this mention as our gratitude and believe that if space permitted, a complete list would be given here.

FREDERIC FULFORTH.

PITTSBURGH BRANCH

My dear Mr. Kennedy:

I suppose that you have been thinking many things, and I know that I should have written you long ago, and expressed my thanks for your visit and being present at our November meeting. I think that Floyd Oplinger had a wonderful talk and I know that it was appreciated. We had our inspection of the samples of the exposure tests on the 17th of November, with about 15 members and visitors taking part, after the inspection those who wished to make the trip were taken to the Standard Steel Spring Co., Coraopolis, Pa., for a trip through their bumper plating department, this trip proved to be most interesting. That evening we held our meeting at the Bureau, and had the opportunity of hearing Dr. Blum. The discussion was well taken care of and I know that those who came were not sorry.

At our meeting on Friday, December 2nd, we had the pleasure of having as our guests, Mr. D. E. Williard, assisted by Mr. George W. Walter, Mr. Edward McIlhenny and Mr. C. G. Cross, of the Detroit Rex Products Co., who gave a lecture on Solvent Degreasing. These men went to no end to give actual model working, cleaning many small parts, and in addition had moving pictures of several very large plant installations, which were all in color. This attraction brought out about forty members and interested friends. The discussion and examination of samples that were being cleaned again and again held every one's interest until well after eleven and I believe this to be one of our outstanding meetings. Many thanks to Mr. W. W. Davidson, Vice President of Detroit Rex Products Co. Mr. D. E. Williard will forward me a copy of the paper he read at this meeting, which I will in turn send on to you for publishing in the REVIEW. I have been expecting some new applications to come in, but have not been able to contact the chairman of our membership committee, Mr. R. O. Hummel. He is quite busy and is out of the city most of the time, but I am hoping that he has a pocket full when he turns up.

STANLEY HEDDEN.

GRAND RAPIDS

Dear Mr. Werft and Members of Grand Rapids Branch:

Please accept through the REVIEW, our appreciation of the successful meeting held by Grand Rapids Branch on Friday evening, December 9, at which

time both Vice President Goodsell and the writer were fortunate enough to attend.

From start to finish, everything was done well. The fact that 132 men were present speaks well for your energetic committee. Your own work and the efforts put forth by your membership committee places your branch at the top of the list for new members received—20 in all since September 1st. (But wait, I just received a letter from Charlie McGinley enclosing a list of 25 additions to St. Louis Branch.) Well, anyway, you were ahead when this letter was started, so let's get back to Grand Rapids.

We watched with interest, an affair such as you planned on an evening other than Saturday. It worked! Starting at 6:30 with a chicken pie supper and ending with a nine act floor show, everything went "as slick as a whistle".

Mr. H. W. Kennedy, representing the DuPont Company gave a fine talk on bright copper. It's a pleasure to see the young fellows address an audience with the confidence Mr. Kennedy showed, and to see how readily he answered questions during the discussion period, proving that he knew his subject.

The four page folder of funnies produced by and presented to the audience as a token of appreciation by the J. C. Miller Company was a complete surprise and was well received.

The orchestra was composed of polishers and buffers, the members of which are to be heartily congratulated for the fine showing they made, and the harmony produced.

All in all, both Ray and I are glad we visited your Branch. Your earnest appeal for membership in the A.E.S. shows your own personal interest, the result of which is becoming more and more apparent.

Please express to your officers and committees our sincere thanks for your kind invitation to visit your Branch. We enjoyed every minute of our stay.

May every success attend your future meetings and may your efforts be crowned with success as you all work together for a bigger and better organization.

Thank you one and all.

Very truly yours,
R. M. GOODSELL.
W. J. R. KENNEDY.

BERT SAGE NOW LOCATED IN NEW YORK STATE

One of our best workers has transferred his activities from the Hub to Olean, N. Y.

Mr. Bert Sage is with the Daystorm Co. of that city. His new address is 270 Irving St., Olean, N. Y. The Boston boys hate to lose Bert, but you can't keep a good man down. Best wishes Bert! We wish you every success in your new location.

ALL WELCOME TO BOSTON MARCH 4, 1939

Boston Branch Will Hold Its Annual Banquet
SATURDAY, MARCH 4, 1939

BRADFORD HOTEL, BOSTON at 2 P. M.

Educational Session in the Afternoon and Entertainment for the Ladies

Floor Show, Banquet and Dancing in the Evening

SUBSCRIPTIONS $2.50

DETROIT BRANCH

Second Annual Educational Session and Dinner Dance

The second Annual Educational Session and banquet was held at the Statler Hotel on Saturday, December 10, 1938. The chairman, Mr. Charles H. Eldridge of the United Chromium Corporation, introduced as the first speaker, Dr. Oliver P. Watts, Honorary Member of the Supreme Society, whose subject was "Corrosion of Metals".

Dr. Walter Meyer, Managing Editor of the *Metal Industry*, was the other speaker and chose for his topic, "Metallic Addition Agents and Impurities in Plating Solutions".

The session closed with a talkie moving picture, entitled "Materials", a General Motors Production. About three hundred persons attended the meeting.

The dinner started shortly after 7 p.m. Almost 600 sat down and enjoyed a well prepared meal, which was served promptly and was over in time, so that everyone could enjoy the finest floor show we have seen at any such event. The banquet hall was beautifully decorated and presented a very pretty picture, with vari-colored balloons predominating.

Jules Klein and his orchestra furnished the music and Jerry Fulton was Master of Ceremonies. There were nine superb acts. The singing of Tommy Evans and Sally Johnson being the highlights.

The program, a 90 page book, is a tribute to the work of the advertising committee, Mr. A. B. Wilson, Mr. Carl Heussner, and Mr. W. W. McCord. Members in charge of the entertainment program were Mr. George Nankervis and Mr. H. M. Cherry.

With one exception, the Executive Board of the Supreme Society was present. President W. M. Phillips called for a short business session at the close of the Research meeting. Routine business was transacted.

At least eighteen out of the 29 Branches were represented.

Horace Smith, General Chairman of the 1939 Convention at Asbury Park was busy, inviting the members to the next Convention and urging them to send in requests for reservations at once.

Charles Conley, President of Dayton Branch, is right after the next Convention for his home town.

Most of us were surprised that the afternoon meeting and the banquet were both started at the time scheduled. This is a most unusual procedure, but very commendable, nevertheless.

Detroit Branch is to be congratulated for the enthusiasm of its workers, and the fine spirit of loyalty and co-operation in undertaking meetings like this on such a large scale. From start to finish everything seemed to be in perfect harmony. It's no wonder these events get bigger and better every year.

KEEP THESE DATES IN MIND

Chicago Educational Session and Banquet, January 28, 1939.

Baltimore-Washington. Date to be announced.

Joint Educational Session and Banquet of New York and Newark Branches, February 18th.

Boston Branch, March 4, 1939.

Thank you! Ed Musick and members of St. Louis Branch.

Secretary of St. Louis Branch, C. T. McGinley, has just sent us a list of 25 applications, the good work of Mr. Musick, chairman of the membership committee of that branch. They're over the top.

Bill Hart of Buffalo Branch also came through with 20 elections this month. "Good work!"

BOSTON Congratulations to Arthur Collins of Boston Branch, who was married on Columbus Day to Miss Mary Mellen. The Springfield boys want to hear Arthur sing again. Best wishes to both Mr. and Mrs. Collins.

BUFFALO The Buffalo members will hold their Chemistry Class at Canasius College Laboratory through the courtesy of the College Faculty.

HATS OFF TO THE LADIES OF NEWARK BRANCH!

One of the outstanding characteristics of the chairman of the 1939 Convention Committee, Mr. Horace Smith, is his ability to get things done. His own dynamic personality as an organizer has much to do with this to the extent that nothing seems to turn him from his purpose if he believes what he does is right and for the best interests of all concerned. We believe this is one of the reasons why his own Branch has been so successful and is also responsible for the men who have promised to share with him the duties and responsibilities of the Asbury Park Convention as Committee Chairman. Not content with enlisting the male members of the Branch, Mr. Smith now has the gentler sex so enthused that they too are as interested in the coming convention as the men. It has always been our desire to see the wives of our members take a more active part in the social side of our society's activities, so we are asking once again that the example set by the Newark Branch ladies be duplicated in other branches.

May we take this opportunity of congratulating Mr. Smith for the idea of getting the ladies to co-operate, and also express our thanks to Mrs. Smith and her splendid corps of loyal and enthusiastic helpers who have shown by their willingness that they intend to do their share in making the coming Convention the greatest in A. E. S. history.

Mr. George Wagner sends us the following report of the activities of the Ladies' Committee.

The first meeting of the Ladies' Committee for the 1939 Convention was held on Monday, Sept. 26, 1938, at the Trustees' Room of the Newark Elks' Club. Mr. Horace H. Smith, General Chairman of the Convention, opened the meeting and appointed as officers Mrs. Horace Smith, Chairlady; Mrs. George Wagner, Sec.; and Mrs. Nelson Sievering, Treas. Mr. Smith instructed the officers as to their duties and then turned the meeting over to them. Following are the names of the ladies who answered the call to act on the committee and have been active ever since: Mrs. Roy Stout, Mrs. George Reuter, Mrs. Daniel Davies, Mrs. Paul Oldam, Mrs. Oliver Sizelove, Mrs. Paul Santella, Mrs. John Kotches, Mrs. William Hodecker, Sr., Mrs. George Klink, Mrs. John Shuhala, Mrs. John Holland, Cecile Tomarazo. They are holding meetings every other Monday.

The second meeting was held on October 10th at the home of Mrs. George Klink. After a short business meeting a Card and Bingo party followed. 15 committee members and 18 visitors were present.

The Third meeting was held on October 24th at the home of Mrs. Horace Smith, where a short business meeting was conducted which was followed by a Bingo party.

The fourth meeting was held at the home of Mrs. William Hodecker, Sr., on November 7th. The business meeting was omitted and the evening was devoted to Card and Bingo games. 14 committee members and 19 visitors attended.

The fifth meeting was held on November 21st at the home of Mrs. George Wagner. The meeting was called to order by Chairlady, Mrs. Horace Smith at 9 p.m. The whole evening was devoted to business. The report was made by one of the committee members that the total proceeds made at the Bingo party on November 15th at the Mosque Ballroom were being turned over to the Ladies' Committee so that they may have a good start towards their contemplated amount for the Convention.

The Ladies' Committee expects to entertain all the ladies who attend the convention, out of funds raised at these various meetings.

PHILADELPHIA BRANCH ANNUAL MEETING

On Friday evening, November 18, Philadelphia Branch held its regular meeting at the Warwick Hotel, with President Joseph Underwood in the chair. There was a large attendance. After the routine business was transacted the Librarian, Mr. E. J. Zurback introduced Mr. L. A. Critchfield of the Hamilton Watch Co., Lancaster, Penna., whose subject was "Watch Parts". This was one of the most interesting talks we have listened to for a long time. The speaker illustrated his remarks by means of many exhibits, some of which reached back into antiquity. Tracing the history of instruments for keeping time from the crude methods adopted by the Egyptians, Greeks, Indians, etc., to the beautiful time pieces of today, some of which are so precise that the wheel clearances are 55 ten-thousandths of an inch, Mr. Critchfield closed his remarks by giving all present very helpful remarks about how to keep our watches in perfect running condition.

The subject was so interesting, the exhibits so fascinating that Mr. Critchfield was asked to present his paper and display at the coming Convention.

The Annual Meeting of Philadelphia Branch was held at the Warwick Hotel on Saturday, Nov. 19, 1938. President Underwood invited some of the visitors from out of town to speak a few words. Amongst those taking part were Ralph Liguori, President of New York Branch; George B. Hogaboom, Chairman of the Research Committee, A.E.S.; Horace Smith, Chairman of the Newark Convention Committee. Representing the Supreme Society were Fred Fulforth of Philadelphia, and the Executive Secretary. Past Supreme President of the A.E.S., Philip Uhl, one of the oldest members of Philadelphia Branch also made a few remarks. After the courtesies were exchanged, President Underwood introduced the Chairman of the Educational Session, Mr. D. B. Robson, who presented the first speaker, Dr. W. E. Stadel, McGean Chemical Co. Dr. Stadel's subject was "Bright Nickel Plating". Mr. Burton G. Daw, of St. Louis, Vice-President of Lasalco Inc., then gave a practical demonstration of what happened in a plating barrel.

Intense interest was manifested in the talk given by Mr. F. F. Oplinger of E. I. Dupont Co., whose topic was "Copper Plating from Cyanide Solutions". A long discussion followed Mr. Oplinger's address, showing the desire for information in Bright Copper Solution, which was the principal item discussed.

The Educational Session closed with an address by Mr. George B. Hogaboom of the H. & V. W. Munning Co., who spoke on the "Production of Special Finishes". Mr. Hogaboom showed the two large panel Boards on which were displayed hundreds of plated, oxidized, enamelled and lacquered finishes.

A rising vote of thanks was given the speakers at conclusion of the session.

The Banquet in the evening was all that could be desired. Nearly 300 sat down. The Committee was busy finding places for the overflow. Beautiful prizes were given to the holders of lucky numbers. This part of the evening's entertainment was in charge of Mr. Horace Smith of Newark Branch and he did a real job. Music and dancing was enjoyed until a late hour. This was one of the best meetings Philadelphia Branch has ever held.

There were six Past Presidents of the Supreme Society present: Messrs Uhl, Sievering, Smith, Hogaboom, Mesle and Gehling.

Dr. Blum, who was in the vicinity on inspection tests, got in near the close of the Educational Session.

The door prizes were the nicest and most useful we've seen.

Leave it to George Gehling to pick up an "artistic" picture. What a gift!

Phil Uhl looks as good today as when we first met him—years ago. Here's wishing you many more.

Messrs. Jackson, Fulforth, Beaver, Underwood, Gehling and all others who had charge of the many details of the meetings deserve the highest praise for the prompt and efficient manner in which the affair was handled.

Thanks to Philadelphia Branch ladies for entertaining their visiting sisters.

From the out of town guests to the members of Philadelphia Branch: Thank you for a swell time!

Report of the Research Committee

Held in Detroit, Saturday, December 10, 1938

A meeting of the Research Committee was held at Hotel Statler, Detroit, Mich., on Saturday, December 10th. There was a very good attendance of the members of the committee and many who are interested in the A.E.S. Research work.

Dr. William Blum and Mr. Paul Strausser made a report that covered the past and present A.E.S. work being carried on at the Bureau of Standards. The committee after some thorough discussion thought it advisable for the chairman of the research committee to appoint a group of five members to act as an advisory committee. This committee will endeavor to establish sub-groups to carry on research or any other investigation of definite problems. There may be sub-committees for the different metals, steel, brass, zinc, etc. Other groups will arrange for the investigation and study of problems that are in need of immediate attention. These will be as far as possible an assembly of existing information that is now had by members of the A.E.S. and the broadcasting of such knowledge so that all members can be kept informed as to what is known. This no doubt, will be of value directly to the production problems of the plater.

The chairman appoints the following members: Mr. E. A. Anderson, New Jersey Zinc. Co.; Mr. James Hanlon, Chicago Branch; Mr. Frederick Fulforth, Philadelphia Branch; Mr. Nelson Sievering, Newark Branch; Mr. Bert Sage, Boston Branch.

The chairman of the research committee will be chairman of this committee so that all problems or subject for discussion can be through the research committee. The men selected not only take in the geographic sections of the Branches, but are near enough to some central point so that frequent meetings can be had. These men also represent men who are acquainted with the several metals that are electroplated.

The research committee after hearing the reports from Bureau of Standards voted to confine the investigation at the Bureau to the effect of the condition of metals as they are received to be electroplated. It is intended to have tests made through the assistance of the Metallurgical Division of the Bureau to determine what effect the forming of basis metals has upon the subsequent deposited metal and upon its protection against corrosion and also the physical appearance of the deposit.

It is hoped that it will be possible to draw up specifications for the several metals used in the electroplating industry. A brief investigation of the effect of cold working of steel has been made during the past few months. The results while not conclusive led to the adoption of the subject of the study of basis metals.

The A.E.S. is most fortunate in having the co-operation of the Bureau of Standards in their work. Our association with the A.S.T.M. especially A5 Committee is also of inestimable value. The three organizations working in close harmony will assist the manufacturer and the plater to obtain a clearer understanding of their metal problems as they relate to the finishing and electroplating processes.

The chairman of the committee wishes to express his appreciation of the sclection of that subject for research as it is along the lines of the talk given before Branch Societies for several years on "What Is Under the Plate"?

Fortunately the assembling of the members of the research committee is not always for work alone as it was possible to attend the educational session and the annual banquet of the Detroit Branch. The success of both, it is ventured to say, far exceeded the expectation of the very efficient committees.

To sum up briefly — Detroit's Annual Meeting was a HUGE success.

GEORGE B. HOGABOOM, *Chairman Research Committee*

27th Annual Banquet and Educational Session

To be held Saturday, January 28, 1939

at The Palmer House. The Educational Session will be held from 2 to 4.30 P. M. The Banquet will be held in the GRAND BALL ROOM at 7 P. M. sharp. Tickets are $3.00 each and can be secured now from the Secretary, M. H. Longfield, 1158 S. Mason Ave., Chicago, Ill.

CHICAGO BRANCH BIDS YOU A HEARTY WELCOME

AN EVENT TO YOUR LIKING

FIRST ANNUAL

EDUCATIONAL SESSION

BANQUET and DANCE

To be held jointly by the New York and Newark Branches
American Electroplaters' Society

SATURDAY, FEBRUARY 18th, 1939

On the Roof Garden of the Hotel Pennsylvania
7th Avenue and 33rd Street, New York City

A NOVEL SETTING AMID PLEASANT SURROUNDINGS

AN EDUCATIONAL PROGRAM OF INTEREST AND MERIT

featuring papers and discussion on Process and Practice in the Metal Finishing Industry, at 2.30 P. M. In the evening, the Banquet at 7.30 P. M., with music and songs and drawings for numerous door prizes of value and utility, followed by dancing and merrymaking as long as you will.

Tickets — $4.00 per person No tipping No chances No extras

Ralph J. Liguori, N. Y. Branch
General Chairman

George Wagner, Newark Branch
Vice-Chairman

Franklyn J. MacStoker, N. Y. Branch
Secretary-Treasurer

A. E. S. Buttons

A small supply of buttons to be worn on the coat lapel will be on hand at the Executive Secretary's office 90 Maynard Street, Springfield, Mass. after January 1st, 1939. The price of these buttons is 40 cents each. They are 9/16" in diameter. Colors, Blue outside. White in center.

Don't Let Your FINISHING ROOM Be a Bottle-Neck

Finishing processes that take a long time to complete are going out-of-date. With modern industrial finishes, processes that formerly took days can often be done in hours...those that took hours, in minutes. This means more rapid production and fewer rejects due to dust spots.

Maas & Waldstein, specialists in finishes for products turned out in quantity, are leaders in the development of modern, "speed-up" finishes. The ideal of both the M&W research staff and M&W field representatives is to "fit the finish to the manufacturing process."

If your finishing room is a bottle-neck, let M&W study your problem and suggest a remedy. A letter will place an M&W finishing engineer at your service.

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Branch Offices and Warehouses . . . 1336 Washington Blvd., Chicago . . . 1228 W. Pico Blvd., Los Angeles

LACQUERS **PIONEERS IN PROTECTION** ENAMELS

Please mention THE MONTHLY REVIEW *when writing*

HISTORY OF THE INTERNATIONAL FELLOWSHIP CLUB

In a small restaurant in the Hotel Pfeister, Milwaukee, in the wee sma' hours, "three o'clock in the morning" to be exact, four representative supplymen happened to find themselves together at a table enjoying a cup of the well-known Java. All being genuinely interested in the affairs of everybody engaged in the Plating Industry, the conversation naturally took the form of something for the betterment of the Industry or the Society. Those present were the following:

John McCabe, Chicago.
Patrick Bergen, Detroit.
Frank Clarke, Springfield, Mass.
Wilfred S. McKeon, Greensburg, Pa.

OLIVER SIZELOVE
President of the International Fellowship Club

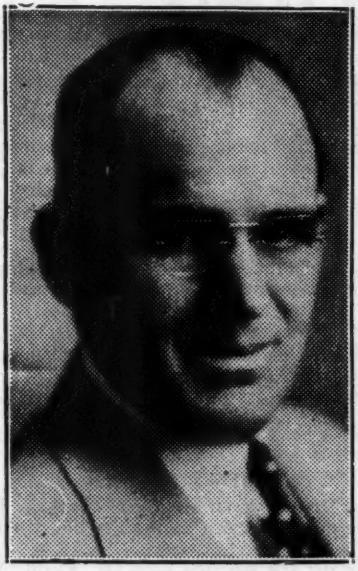
During the conversation Mr. McKeon said something as follows: "There ought to be some sort of an organization exclusively for the Suppliers". Whereupon Frank Clarke spoke up and said, "Wilfred, that's a knock-out of an idea and you're just the man to bring it into being". It was decided then by the four present that an attempt at a meeting would be made the next day, the last day of the convention.

At the close of the Convention, when the suppliers were tearing down their exhibits, a bell boy was hired to announce that there would be a meeting of all Suppliers in Parlor B just off the Mezzanine at 4 p.m. that day. Being very careful to see to it that the meeting of the A.E.S. had come to a con-

clusion, and amid the rattle of packing, this bell boy went about summoning the supplymen to "come to Parlor B at once".

Possibly something like twenty came. The meeting was called to order by Mr. McKeon who outlined in a general way what had been discussed at the previous meeting of the four who can now be called the original charter members of the I.F.C. Some remarks were made by Mr. Clarke and questioning was encouraged. A motion was made and carried that Mr. McKeon act as temporary Chairman of this meeting. John C. Oberender of New Haven, Conn., was appointed as temporary secretary to make a record of anything that transpired.

After a lot of general discussion and questioning, it was decided to appoint a committee to look further into the feasibility of some such organization.



WILFRED S. McKEON

The committee consisted of John C. Oberender, George Lawrence, and Wilfred S. McKeon. This committee got together and decided to hold a meeting at the Hotel Taft in New Haven six months thereafter. This meeting was held and a definite plan formulated to be submitted to all those interested in it at the next annual Convention of the A.E.S.

This convention was held at Montreal. A luncheon was arranged on the opening day of the Convention and 16 men were present. A permanent organization was thereupon set up with Wilfred S. McKeon of Greensburg, Pa., as head of that organization. With deference to the Canadian members the title of the head of the group was "Chairman" instead of president. John C. Oberender was elected Secretary and W. W. Wells, Jr., of Toronto was elected Vice Chairman. Practically all of the 16 men present gave their views about this new organization being brought into existence. It was decided to call the organization the International Fellowship Club.

It was definitely decided that in essence a motto as follows should be adopted. "We shall neither stand in the light nor in the shadow of the A.E.S.".

From that time on annual meetings were held on the occasion of Interna-

tional Convention of the A.E.S. Following the precedent set in Montreal, the I.F.C. has always been wholly informal. Its very flexibility has possibly been one of the secrets of the success it has attained.

There is no initiation or ceremony. The very fact that you are a supplier of a service or a product to the plating industry makes you eligible for membership. You come to a luncheon and break bread with us and that constitutes your membership. We have no dues. When you pay for the luncheon that is all the payment necessary for membership.

At the 1927 Annual Meeting in Toledo it was decided that a code of ethics should be worked out. This was drawn up and adopted.

Beginning with the Washington (1930) meeting there have been local branch annual banquets in addition to the National Convention. These local branch banquets have been held in the following cities: Newark, New York, Rochester, et al.

The Officers are changed every year, Vice Chairman usually being made Chairman. At the Detroit meeting it was decided to elect a permanent Secretary. Thomas A. Trumbour of New York City was elected to this position and has been so functioning ever since.

Beginning with the Rochester meeting it was decided to have the I.F.C. foster and finance an "Open House" meeting. This was a gathering the first night of the Convention of all the registrants. In the language of a well-known world war service organization, "Everybody welcome, everything free". This was financed by a voluntary contribution on the part of supply houses represented in the I.F.C. Since that time this has been an annual affair given gratis by the I.F.C. which has made a warm spot for this organization in the hearts of everybody attending these conventions. This is officially attested by a letter of recognition from the Supreme President of the A.E.S., Mr. E. Steen Thompson.

This organization makes a very nice unit to hold together suppliers in the industry. It is an ideal arrangement for furnishing a definite body with a definite head. Thus, the suppliers can be addressed or can speak for themselves at any time their interests are assailed or have to be explained. Through such a body all interested parties can be reached at one time.

NEWS LETTER

The December open educational session of the New Haven Branch of the A.E.S. was held Tuesday, Dec. 6th at the Sterling Chemistry Laboratory of Yale University.

The guest speaker for the evening was Mr. Frank Mesle of the Oneida Community Silver, Ltd., Oneida, New York, who gave a very interesting and enlightening talk on "Specifications and Qualifications for Electroplating". Mr. Mesle pointed out that more and more, specifications as to thickness of electroplated deposits are coming to the foreground. In many plating contracts, minimum thicknesses of plate are specified, and this specification must be upheld even in recessed areas. The applicability of the "chord method" of measuring electroplated deposits was shown by Mr. Mesle.

Following the lecture, Mr. Mesle answered several interesting questions on the talk. Tom Chamberlain acted as chairman of the meeting.

Prior to the open meeting, a short business meeting of the New Haven Branch was held. At this meeting seven applicants were elected to membership in the A.E.S.

The next open meeting of the New Haven Branch of the A.E.S. will be held Tuesday, Jan. 10, with Mr. O. A. Stocker of the Seymour Mfg. Co., as guest speaker.

In conclusion, in behalf of the members of the New Haven Branch, I wish you a Merry Christmas and a Happy New Year.

Sincerely yours,

JOSEPH T. SULLIVAN.

You Can Make A 75% SAVING

in the Time of Cyanide Copper Plating

by using the NEW Du Pont HIGH SPEED COPPER • PROCESS •

HEAVY coatings—0.001" to 0.002"—in 10 to 20 minutes at 100% cathode efficiency! And on a steel rod, a 0.034" deposit in 2½ hours, plated at 125 A/SF, an unusual thickness for cyanide copper. These results are typical of the speedy cyanide copper plating which can be obtained with this new and different process.

The deposits are uniformly bright, free from pits and other imperfections—excellent surfaces for direct deposition of bright or dull nickel. The deposits can be easily buffed because of uniformity and fine grain structure.

For some articles, such as printing rolls, wire, rods, the process can be adapted to a current density of 100-200 A/SF. Smooth deposits of copper can be built up rapidly.

The du Pont High-Speed copper plating process can be installed in usual cyanide plating equipment. The solution is readily prepared from pure compounds, which are completely and readily soluble in water. The same chemicals are used for maintenance and replenishment.

CONSIDER THESE ADVANTAGES:

- ★Bright lustrous deposits on steel and die-castings.
- ★High Speed Plating — about 4 times as fast as present commercial practice.
- ★Heavy coatings—up to 0.033" or more.
- ★Soft, fine-grained deposits which can be easily buffed.
- ★100% efficiency at the Cathode, up to 60 A/SF.
- ★100% efficiency at the Anode, up to 30-40 A/SF.
- ★No Pitting.
- ★No hydrogen or noxious fumes.
- ★Negligible cyanide decomposition.
- ★No sludging or polarization of anodes.
- ★Simple Control.

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THE CAVALCADE of AMERICA Back on the Air EVERY MONDAY EVENING at 8 p. m. Eastern Standard Time, Columbia Broadcasting System. (Rebroadcast 9 p. m., Pacific Time.

CONVEYORIZED THREE-DIP DETREX DEGREASER

As a recent addition to their line of standard automatic and hand-operated degreasers, the Detroit Rex Products Company, Detroit, Michigan, has recently developed and built the machine shown in Fig. 1. This machine is used for the removing of oil, grease, and dirt from all kinds of work, such as stampings, castings, and screw machine products prior to painting, plating, inspection and heat treating.

The sequence of cleaning operations, which are performed automatically after the basket of work is hung on the cross rod of the conveyor chain is immersion in boiling solvent, immersion in clean solvent rinse, and final cleaning and drying in pure solvent vapors. The metal parts or assembled products are cleaned with stabilized non-inflammable, non-explosive safety solvents—either PERM-A-CLOR or TRIAD. They are immediately ready for finishing without any scrubbing, mess, or extra dryoff.

While this design of machine is built in several standard sizes, the particular unit shown accommodates work up to 36 in. long by 15 in. wide by 15 in. deep and 20 in. hanging. The approximate overall dimensions of the degreaser are length, 12 ft.; width, 6½ ft.; and height 10 ft. It has a total solvent capacity of 250 gals., and the approximate weight is 6300 lbs.

At a normal conveyor speed of 6 ft. per minute, the rated production cleaning capacity is 2000 lbs. of work per hour. The minimum production rate is one basket per minute and the maximum production cleaning rate three baskets per minute.

This automatic machine is equipped with a return-type crossrod conveyor designed to load and unload at one end and with return flight of conveyor in upper hood. Crossrods, from which baskets of work are hung, are spaced at regular intervals along the two strand conveyor chain. ¾ H.P. motor drive, speed reducer, and variable speed are mounted on the upper hood and drive the conveyor chain through through-shaft and drive sprockets. Conveyor chain take-up device is located on sprockets at entrance-exit end. Oilless bearings are used on all sprockets inside the vapor zone.

The degreaser is fabricated from steel plate, reinforced with structural steel and of all-welded construction. The inside is hot zinc spray coated after fabrication.

The solvent boiling chamber is heated by a steam jacketed bottom and steam coils. This machine is equipped with safety steam pressure relief valve and an air-operated, vapor-actuated temperature indicator and steam control, complete with air filter and pressure reducer, by-pass piping, hand valves, strainer, and steam pressure gauge. It is also equipped with a motor operated solvent transfer pump to return distillate from the third or vapor chamber to the first or boiling chamber. This pump can also be used to transfer solvent into or out of the machine and between any of the chambers. Each of the three chambers (boiling chamber, clean solvent rinse, and vapor chamber) are equipped with removable cleanout doors. The upper hood is fabricated of galvanized steel reinforced with structural steel of welded and riveted construction. There is a skylight on top of the hood and a large access door in the back.

The water jacket condenser completely encircles the machine, is stayed and welded. The clean solvent collecting trough for collection of the distillate from the condenser encircles the inside of the machine beneath the water jacket condenser. The return line from solvent collecting trough is equipped with two water separators and vapor traps. The distillate returns to the rinse chamber, thus continuously renewing it and keeping it clean during operation. The rinse, in turn, overflows into the third or vapor chamber, and this solvent overflow is returned to the boiling chamber by a continuously operated motor driven solvent transfer pump. The pump is arranged with necessary piping so the solvent can be transferred between any of the chambers in the machine and for filling or emptying the machine conveniently.

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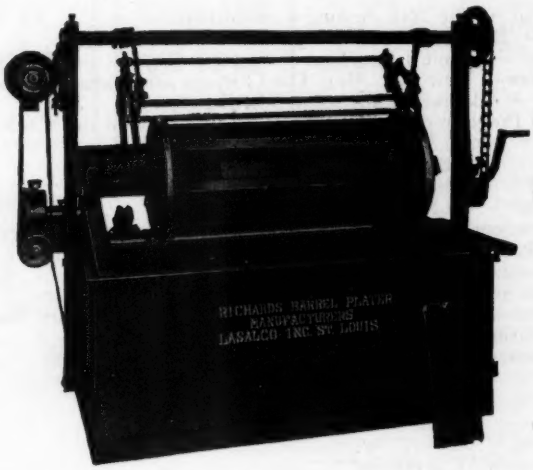

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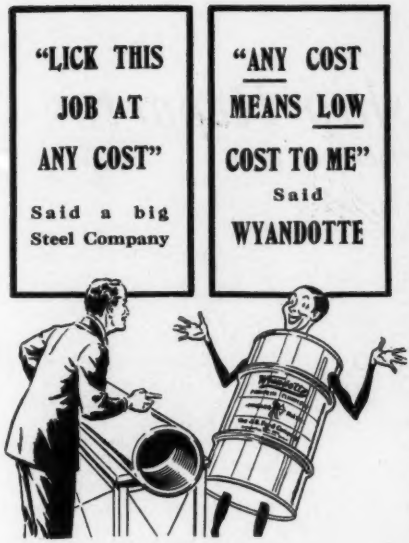

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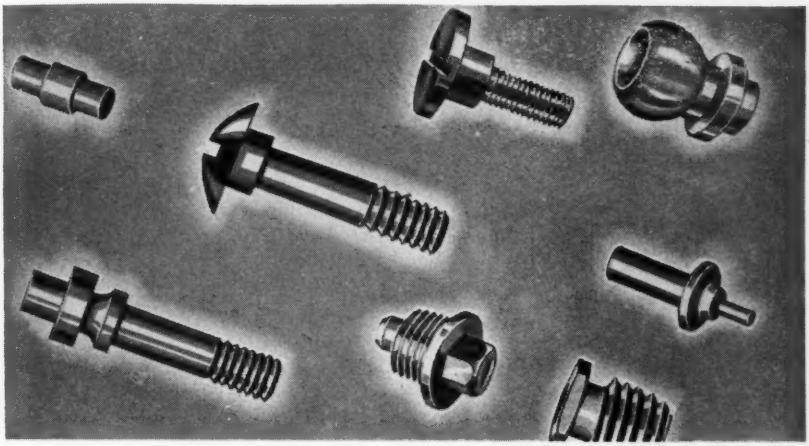

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